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Therapeutic Gazette.

Whole Series, Vol. XVI. | DETROIT, MICH., PHILADELPHIA, PA., | November 15, 1892. | Third Series, Vol. VIII. No. 11.

CONTENTS.

Original Communications.

PAGE

Diagnosis in Abdominal Diseases, and an Operation for Fibroid of the Uterus. By E. E. Montgomery, M.D. 721
Notes on the Treatment of Dysmenorrhœa. By J. H. Musser, M.D. 725
Metric Prescribing and Posology. By A. L. Benedict, A.M., M.D. 729
Enteroclysis of Ice-Water in the Treatment of Intestinal Diseases of Children. By Julius L. Salinger, M.D. 733
Nephrectomy in a Child of Two Years—Recovery. By Marie B. Werner, M.D. 734
Report of a Case of Right-Angled Deformity of Knee, resulting from Tubercular Arthritis. By James F. E. Colgan, A.M., M.D. 739
Some Notes on the Corneal Astigmatism in Two Hundred Eyes measured with the Ophthalmometer of Javal, in Comparison with the Total Subjective Astigmatism after Complete Mydriasis. By G. E. de Schweinitz, M.D. 740

Leading Articles.

Diagnosis and Treatment of Foreign Bodies in the Cornea 750
The Treatment of Intestinal Fermentation and Indigestion 752
The Modern Treatment of Wounds 753

Reports on Therapeutic Progress.

The Internal Use of Lysol 756
Ointment for Chronic Gonorrhœa 757
Antiseptic Paper 757
A Tonic Prescription 757
An Ointment for Eczema of Infants 757
Injection for Catarrh of the Bladder 757
A Liniment for Acute Infantile Palsy 757
The Treatment of Cholera 757
The Treatment of Summer Complaint 758

PAGE

The Use of Sulphonal in arresting the Cramps of Fractured Limbs and other Reflex Spasms 760
The Treatment of Dysentery by Injections of a Solution of Carbolic Acid 761
A Case of Aconite-Poisoning 761
A Prescription for Painless Dilatation of the Cervix Uteri 761
The Treatment of the Summer Diarrhœa of Infants 761
The Treatment of Epilepsy 762
A Powder and Solution for Acute Coryza 764
Cholagogue Cachets 764
An Antiseptic Cathartic 765
The Treatment of Gastralgia and Atonic Dyspepsia by Electricity 765
Strychnine and Digitalis in Diarrhœa 767
Prescriptions for Gonorrhœa 768
Injections for Seat-Worms 768
Treatment of Diseases of the Skin and Beard 769
An Ointment for Hemorrhoids 770
Purgative Pills 770
The Restoration of the Apparently Drowned 770
The Application of Ice to the Spine as a Therapeutic Measure 771
Suture of the Lung 772
Antiseptics in Midwifery 772
A Formula for the Administration of the Salts of Strontium 774
Prescription for Summer Diarrhœa 774
Injections for Acute Vaginitis 774
A Lotion for Burns 775
The Treatment of Alopecia by Iodated Collodion 775
The Absorption and Elimination of Mercury in the Human Body, especially after the Injection of the Salicylate 775
Bleeding for Acute Articular Rheumatism 776
The Thermal Treatment during Pregnancy 776

PAGE

Treatment of Bubo 777
Treatment of Certain Forms of Ulcer of the Cornea by an Occlusive Antiseptic Dressing 777
Treatment of Infecting Wounds of the Eye 777
Trichloride of Iodine as an Antiseptic in different Ocular Affections 777
What can be done for Incipient Cataract 778
Cataract Operations and After-Treatment 778
The Surgical Treatment of Granular Conjunctivitis 779
Gunpowder Injuries to both Corneæ, Irides, and Lenses, with subsequent Restoration of Vision to almost Full Acuity 780
The Clinical Value of repeated Careful Correction of Manifest Refractive Error in Plastic Iritis 781
Experimental Inquiry into the Origin of Corneal Opacities after Cataract Extraction which have been lately noticed 781
A New Method of operating in Ptosis 782
New Method of Extirpation of the Rectum 782
Treatment of Fistula by Immediate Suturing 783
Resection of the Shoulder for the Cure of Recurring Luxation 783
The Management of Eczema in Infants and Young Children 783
The Influence of Asepsis and Antisepsis in the Prophylaxis of Urethral as distinguished from Urinary Fever 785
Excision of Cancer of the Rectum 785

Reviews 787

Correspondence.

London Letter 789
The Treatment of Pleurisy 792

Original Communications.

*DIAGNOSIS IN ABDOMINAL DISEASES, AND AN OPERATION FOR FIBROID OF THE UTERUS.**

BY E. E. MONTGOMERY, M.D.†

THE patient I bring before you to-day is a woman about 50 years of age. As she lies upon the table with the abdomen bared, you notice that it is very prominent at the central portion, standing up, presenting an appearance very much like that of a large cyst. You will notice that the distention is symmetrical, and more prominent about the level of the umbilicus. The projection is almost cone-shaped, and if you look at its superior surface, you will notice that there is a slight unevenness, presenting the appearance of thinned walls, with the mass projecting through them. Now, I will ask this patient to relax her abdominal muscles, when you see that the entire mass disappears and the abdomen becomes flat. You will ask me what is the cause of the changed appearance

* Clinical lecture delivered at the Jefferson Hospital, October 11, 1892.

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in the abdomen when the muscles are contracted and again when perfectly relaxed. As I place my hand on the abdomen I notice that there is a considerable separation of the recti muscles,—muscles, as you know, situated in the central part of the abdomen between the ensiform appendix and the symphysis pubis. Under some previous distention of the abdomen, these muscles have been pushed apart until between them there is a large surface intervening, consisting only of the skin, superficial fascia, and peritoneum.

Now, when this patient contracts her abdominal muscles, the pressure made upon the intestines forces them out through this weakened ventrum, and they push before them the skin and peritoneum and are grasped firmly upon either side by the muscles, so that we have here a large ventral hernia. I saw a case, similar to this, in a woman in one of the cities of this State, in consultation with several physicians, where the diagnosis had been made of an ovarian tumor. The call to me was in the nature of an invitation to assist in an operation for its removal. I found the patient, a woman weighing about two hundred pounds, with a tumor in the central part of the abdomen resembling somewhat an inverted dish-pan. I very quickly realized, without making an examination, that we had not to deal with an ovarian cyst. In pressing my hand on the abdomen I found that the tissues had become so thinned out that there was only skin and peritoneum covering the intestines. The coils of intestines could be very distinctly felt, and we succeeded after consultation in assuring the patient that it would be an exceedingly dangerous thing to attempt the removal of her tumor.

If this patient now under observation was able to continue the contraction of her muscles, it might be difficult upon inspection and palpation to determine that we had not a cyst, for the parts are so tense during the times the contraction is made that the protruding mass seems very much like a tumor. In such cases, however, we are enabled to determine distinctly the condition by the process of percussion, placing the finger on the mass and striking it with the other hand. We in this way elicit resonance, disclosing the fact that the distention is produced by air-containing viscera. If a tumor were present, we would find that there would be dulness upon percussion. These cases illustrate to you the importance of studying the methods of procedure in examination of cases. Percussion is of great value in such cases in demonstrating the character of the distention. Thus, in the air-containing tumor, the percussion will be resonant over the entire surface. If the abdomen, however, should contain free fluid, we will find that percussion is resonant over the summit of the distention, while it will be dull around its borders. This is due to the fact that the intestines, being filled with gas, are lighter than the liquid accumulation, and consequently float to the surface. There is a possibility of error in such cases, however, in that we may find there is dulness over the entire surface, while fluctuation indicates that it is liquid; but by depressing the surface and then percussing, we find that resonance is obtained. The explanation of such cases is that the distention is too great and the mesentery not sufficiently long to permit the intestines to float to the surface; the layer of fluid intervening gives rise to dulness upon light percussion; pressure displaces this fluid and brings the abdominal parietes in contact with the intestine. In cases in which the mesentery has undergone shortening as a result of inflammation, or the intestines are bound down, we may be unable to arrive at a definite diagnosis until an exploratory incision has been made. In tumors, aside from demonstrating by percussion, that the fluid is contained within certain limits, we are also enabled to form an idea of the side from which the tumor has taken its origin; thus, if the tumor is situated in the left side, as it increases in size it pushes the intestines upward and to the other side, so that finding resonance upon the right side and dulness upon the left in abdominal distention, we would be justified in saying that the tumor more than likely had its origin from the left ovary. The distention in this case is plainly due to the pushing out of the viscera through the weakened ventrum. Careful examination fails to disclose any solid mass within the abdominal cavity. The size of the distention precludes the wisdom of any effort at restoring the separated aponeurosis, so that all it would be wise to attempt to do for such a patient would be to prescribe some method of supporting the abdomen.

The next patient I bring before you is a woman 54 years of age, who suffers from abdominal distention, the character of which we will endeavor to determine. The abdomen is not so largely distended as in the patient I have just had before you, although the abdominal walls, as you notice, are more

tense. The abdomen is symmetrically developed, somewhat flattened, and presents no indication of irregularity. As the hand is placed over it and pressure made upon one side, while the other side is palpated, or struck upon, I notice a distinct wave of fluctuation felt from one side of the abdomen to the other. In the central part of the abdomen I notice, by depressing the fingers, that the fluid is displaced until the fingers come in contact with a solid mass. This solid mass I am able to outline, and find it situated in the central part of the abdomen, reaching up to the level of the umbilicus. It extends probably three or four inches on either side of the median line. The mass is firm, inelastic, irregular or nodular in outline, and quite movable. The question to decide is what is the condition we have present. The ease with which this fluid is displaced, the distinctness of fluctuation, and the readiness with which the hard, firm tumor can be outlined, lead me to feel assured that we have to deal with free ascitic fluid complicating an abdominal growth. The history of the patient discloses that menstruation has ceased ; she has one child, twenty-four years of age ; she has never had a miscarriage. Fourteen years ago she first noticed a small tumor. Now this fluid accumulation might result from disease of the kidneys, the heart, or the liver, and hence be constitutional. Examination, however, discloses the fact that she has had no swelling of the limbs or any other part of the body except the abdomen. This fact of itself would exclude the probability of the accumulation being either renal or cardiac. The appearance of the patient, the want of any history of use of alcohol, the absence of jaundice, would render improbable its origin from hepatic disease. We are forced, then, to the conclusion that the accumulation of fluid is due to the irritation of the peritóneum by the presence of the growth, or to the pressure of the latter upon pelvic vessels, interfering with the return circulation, causing effusion to take place. What is the character of this growth ? Its situation in the lower part of the abdomen would indicate that it must arise either from the uterus, the appendages, broad ligament, the cæcum, rectum, or the retroperitoneal glands. The latter condition is exceedingly rare, and it is only infrequently that it would come under consideration. It should not be forgotten, however, that it does occur, giving rise sometimes to tumors of large size.

A case only recently came under my observation, in which a young girl, 18 years of age, had a large abdominal distention which had begun some nine years before, following an attack of mumps. As it is not unusual for a metastasis of mumps to the ovaries, it seemed a very natural inference that this was the origin of the condition, giving rise to irritation resulting in a large growth. Examination over the abdomen disclosed a tumor, regular in outline, more or less elastic, presenting no hardness or density such as would be present in a uterine fibroid ; it is well to remember, also, that uterine fibroids occur very rarely in one so young, so that we had little hesitancy in believing that we had to deal with an ovarian tumor with thick, viscid contents, rendering fluctuation absent, but sufficientiy elastic to lead us to suspect that it was fluid. The patient was subjected to operation, and as soon as the abdomen was opened, instead of a white, pearly, glistening appearance of the tumor, such as we would expect to find in an ovarian cyst, it was reddish, somewhat irregular, but still sufficiently elastic to lead us to believe that it contained fluid. A trocar was plunged into it without securing a drop of fluid. The incision was then lengthened so that the tumor could be lifted up, when it was found that it protruded from the pelvis, pushing the peritoneum before it. The uterus was drawn up some distance on its anterior surface. The peritoneum behind the uterus was cut through, the uterus torn off, and in the attempt to enucleate the tumor it was broken, and that portion above the level of the pelvis removed. The portion below was then peeled out, giving a mass the size of a child's head. The patient did well until the abdomen was closed, when she began to sink, and in spite of hypodermic injections of strychnine to sustain her, she died in less than an hour after the operation. Death was undoubtedly due to the removal of the pressure upon the vessels, permitting them to become distended, and the patient thus bled into her own veins. Subsequent examination disclosed that the tumor had had its origin in the retroperitoneal tissues, had pushed before it and to one side the rectum, and drawn up the uterus.

The distinctness, however, with which this tumor can be outlined in the patient before us, would render it exceedingly improbable that it could have had such an origin. It does not answer to the characteristics we would expect to find in tumors of the ovaries or tubes. While we may have fibroid tumors

or sarcomatous tumors of the ovary, yet the relation of this tumor to the pelvis is not such as we would find in a tumor of one of these organs. So also its situation does not correspond to that of a tumor of the rectum or of the cæcum. In such tumors the mass also would be less movable. We are then forced by this process of reasoning to believe that the tumor has had its origin in the uterus. Tumors of the uterus attaining to the size of this one are usually fibroid. They are divided according to the situation into submucous, subperitoneal, and interstitial. The tumor in the present instance attaining to the size it has, presenting irregularities upon its surface, together with the absence of any history of hemorrhage or excessive menstruation, leads us to believe that we have to deal with a fibroma involving the external surface of the uterus, and which has not produced much degenerative change in the mucous membrane of the organ. While the tumor has not given rise to hemorrhage or to excessive menstruation, it is undoubtedly due to it that the menstrual flow was continued to so late a date, as by the history we see that she continued to menstruate until fifty-two years of age. The treatment in such a case we will consider at a later date.

The next patient is a woman who has entered the hospital presenting the following history : 42 years of age, a native of England ; family history negative ; she was healthy as a child, and puberty occurred at fourteen years ; was "regular" from that time ; she married at eighteen, first child was born eighteen months later. After this she felt pain in the right side and noticed a lump. She became pregnant a second time thirteen years after the first, and gave birth to a child. Following this she had a large tumor in the right side. She carried the tumor for a number of years ; finally underwent an operation by Lawson Tait, of Birmingham, England, who removed a fourteen-pound tumor from the right side. This occurred five years ago. Two months later she felt pain in the left side; later she again felt a tumor in the right side. This patient has suffered from excessive menstruation, the menstrual flow also being prolonged. She has a large fleshy abdomen, and it is difficult to determine and outline the character of the pelvic distention. We find a mass situated to the left of the uterus, which is quite firm, somewhat movable ; it is apparently connected with the organ. As we are unable to distinctly determine its character, in view of the severe hemorrhages from which she suffers, we feel justified in making incision to complete the diagnosis, and if nothing more can be done, to remove the supposed remaining ovary.

As the patient lies upon the table you will notice the line of incision made by Mr. Tait, which is very short, not over an inch and a half, and is scarcely seen. The advocates of the short incision claim that the patient is less likely to suffer from hernia than where a longer incision is made, but I think that those of you who are close enough to be able to observe the appearance of this abdomen will see that there is a peculiar or suspicious prominence beneath the cicatrix, and as I place my hand upon the abdomen, I find that there is evidently a pouching out here of the contents of the abdomen through the ventrum. As the small incision is not necessarily a safeguard against hernia, as a large incision heals as quickly, and, if careful union be secured, will be just as firm as the smaller, I prefer to make an incision sufficiently long to enable us to exercise the sight as well as the touch, and I shall, therefore, not imitate Mr. Tait in making a short incision.

Before beginning the operation, we place the patient upon this apparatus, which is used for the purpose of securing the Trendelenburg posture. The apparatus was introduced by Dr. Krug, of New York, who has used it in a large number of cases. Incising the abdomen we find the abdominal walls very thick and fatty. As I approach the former incision, I exercise great care for fear that a knuckle of intestine may be pushed up and injured. I notice in the small pouch I have just opened, a projection of the omentum, so that we will proceed now with great care in the remainder of the incision. I open above the incision, hoping in this way to escape contact with the adhesions. As the abdominal cavity is opened, I pass my finger below, I find that the omentum has pushed out through the cicatrix, establishing a considerable cavity, to which the omentum is very firmly adherent over its entire surface, and it is with considerable difficulty it can be torn off. As I pass my finger down in search for the uterus as a landmark, I find everything matted together, and there is considerable difficulty in separating the intestines and omentum from the uterus and the pelvic mass. As I do so, I find a projection upon the right side as large as an ordinary orange. Passing the finger around the uterus, I find another on the posterior surface, and a third upon the left side, with numerous small projections from the fundus.

We push off the adhesions, and bring the uterus containing the tumors into the wound. We are facilitated in doing this by placing the patient in the Trendelenburg posture, so that the intestines fall away from the mass.

The question arises, How shall we proceed to relieve the patient from the presence of these growths, which seem to have given her a great deal of distress? If we remove the uterus in a woman of thick, fleshy abdominal walls, with extensive adhesions, with the parts more or less fixed, it is an operation of no little difficulty. To amputate the uterus, or do what is known as supra-vaginal hysterectomy, is difficult, for the reason that the uterus is so fixed that it is almost impossible to bring it up into the wound to such a degree as will permit throwing a ligature or applying an écraseur about the stump and bringing it out at the lower angle of the wound. As these masses project from the surface of the uterus I shall proceed to incise the structure, cutting through to the capsule of the tumor, then tearing it out, leaving in this way the cavity from which it was removed; the second and third ones are removed in the same way. I began this procedure with a view of, in this way, forming a pedicle around which a serre-nœud wire might be placed, but as this is somewhat difficult, and there is but little tendency to bleed from the cavities from which the enucleation was made, I shall proceed to sew the incised surfaces together with a continuous suture of catgut, taking particular care to invert, or turn in, the edges and bring in contact the peritoneal surfaces, doing a modified Cæsarean operation, or, in other words, suturing the uterus in the same manner as if this operation had been done. As there is considerable oozing of blood from the adhesions that were torn off from the uterus, we will secure drainage by what is known as the Mickulicz drain,—placing a piece of iodoform gauze, with a string tied to its centre, in the cavity, and packing into this improvised sac considerably more gauze; in this way I induce pressure, and, at the same time, through the capillary action of the sac, secure drainage. The wound is closed with silk-worm-gut sutures, leaving the gauze packing projecting from the lower angle of the wound. In the manipulation I have been unable to see any sign of either ovary, but feel convinced, from the hemorrhages the patient has been suffering, that some ovarian stroma must still remain. I am quite well aware that Mr. Tait has a peculiar pathology of his own, and regards the tubes as the source of irritation which gives rise to the menstrual flow, but I am convinced that this is not the case, and feel satisfied that wherever hemorrhage occurs, some ovarian stroma has been left; that if the ovaries are removed intact, the menstrual flow will subsequently cease.

NOTES ON THE TREATMENT OF DYSMENORRHŒA.

By J. H. Musser, M.D.*

THE writer knows of no affection the successful management of which depends more upon a broad understanding of physiological and pathological processes, and a greater breadth of view of hygienic and therapeutic measures, than dysmenorrhœa. The hard and fast lines of specialism must be erased to treat this disease successfully. Indeed, the *specialist* is not successful in its treatment. This remark is not unjust to the able and distinguished physicians, many of whom are styled specialists. It *is* unjust to the broad-minded man of comprehensive resources to be called a specialist. Indeed, the term should be used in a specific sense only. It is a serious restraint to the advancement of medicine to have it abused. It is lamentable to hear the young tyro declare he means to take up a specialty. It is not the writer's wish to decry the term "specialty" in a broad sense. In the use of certain instruments of precision or investigation it is well that persons should be specially prepared; in the use of certain methods to relieve disease, persons should be specially trained. The education of the special senses in a specific direction to the highest point of development is essential to secure the recondite facts of disease. In our art the highest attainment of particular faculties are necessary, and this can only be done by special education, often at the expense of other faculties. Hence, one might say, the art of medicine should be special, the science or knowledge of medicine should be general and comprehensive.

Asking pardon for this protest against "specialism," the writer begs to call attention to the treatment of dysmenorrhœa viewed from the stand-point of the general practitioner. He disclaims any intention to treat of the disease in the comprehensive manner worthy of it, both from lack of time

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as well as ability. The following is, therefore, simply a disjointed record of personal experience.

In common with other practitioners, the writer has been compelled to ask the assistance of men specially trained in the treatment of this affection, therefore he has had the opportunity of witnessing the results of many of the surgical measures which are now or have been in vogue recently. He has seen removal of the ovaries and dilatation of the cervical canal performed, and pessaries used upon selected cases of this character by the most competent hands. The result has been in many of the cases disappointment. Let this experience be placed before you briefly.

In the dysmenorrhœa of single life removal of the ovaries did not cause cessation of pelvic pain in the one instance in which the writer had been weak enough to allow it to be employed. Not only did the pain occur periodically, but became more or less persistent, and was attended by the usual and even more aggravated nervous phenomena. The writer advised against this operation in two instances, both of which will be referred to again, with results most satisfactory to the patient. Dilatation of the canal by rapid means, as well as the gradual method, have been very disappointing. The former method in several instances gave relief temporarily, but in three or four months there was a return of the severe pain. Such, too, was the case in the latter method, and the actual relief experienced was due as much to the general treatment employed as the use of the mechanical means.

It must be a very grave case in a young unmarried woman that will excuse a vaginal examination. In dysmenorrhœa with dislocation of the uterus by a previous accident, mechanical means, as pessaries, should be used, and are often successful, but they have always availed but little in other forms of the disease. Not only was it distressing and embarrassing, and the cause for the most serious nervous manifestations to place a pessary, but its presence did not give satisfactory relief, and hence became an inert, foreign body.

The use of the above means having been unsatisfactory, medicinal means, as usually advised, were resorted to, and it is true in a number of cases with success. Some cases of dysmenorrhœa improved with tonics, and particularly strychnine in the intervals and the use of sedatives during the attack. The prescription recommended by Bartholow was highly serviceable in a number of cases when administered during the time of pain. One cannot constantly administer anæsthetics and opiates during the painful period. It is true hypodermic injections of morphia, or opium and its alkaloid administered in other ways, gives relief. Usually the neurotic patient, for such they often are, has a special idiosyncrasy towards this drug, so that a train of disagreeable symptoms arise on account of its administration. It is natural, therefore, that one should cast about for other anodynes less distressing to the system. Their use will be discussed later. A word should be said with reference to the bromides and the inhalation of ether, chloroform, or nitrite of amyl. The latter drug has been of temporary service, and sufficiently bad cases have been seen which required the administration of ether at the monthly period. As a result, three or four days were taken up by the patient recovering from the distressing effects of two or three days' almost constant dosage with the anæsthetic. One case is recalled particularly in which the pain was so very severe, and the prostration subsequently so great, that a number of persons advised removal of the ovaries, but the writer found that during residence at the sea-shore the monthly paroxysms were at a minimum, and during some periods no pain at all was experienced. The operation of oöphorectomy was advised against. The patient and her friends agreed with the writer that it was much better to spend one week at the sea shore in comfort, with disturbed family relations even, rather than undergo an operation which might be fatal, or be followed by a train of serious consequences, the nature of which could not well be predicted.

In certain cases the use of the bromides before and during the menstrual period give sufficient relief to render the period bearable. Indeed, a large majority of cases prior to the treatment which the writer has adopted were treated by the use of this drug, with tonics in the interval, than in any other way.

In addition to the above-mentioned measures, in certain cases of dysmenorrhœa, rest in bed, with the use of massage and electricity, had been advised, but, like rapid dilatation of the canal, with relief to the patients for a time only, in the writer's experience. Unless the patient had every circumstance in her favor to lead a perfectly rounded hygienic life, a relapse took place. The favorable circumstances required to prevent this relapse are some occupation of the mind to prevent depression of the spirits and health, and

an out-door life, so that the benefits of fresh air and active exercise may constantly be maintained. The exercise, of course, should be judicious, and usually is of a character that only the more affluent could secure. The summer outings and winter changes of climates to keep up the general health are essential, otherwise these rest cases always relapse. The unsatisfactory results of treatment by the means just noted applies not only to the cases under the writer's care, but also to cases that were observed under the care of other physicians, whose experience was such as to render their management of the case by this means without criticism.

Many will join the writer in concluding that operative measures, mechanical and medicinal means, rest and the electrical treatment, and massage have been disappointing. The plan indicated in these notes has more often been most satisfactory. Certainly the writer had the satisfaction of seeing many who had been ailing for years relieved very much, and some permanently cured.

The determination of a plan of treatment of a case of dysmenorrhœa depends upon its character and associated phenomena, and particularly upon the general nutrition and health of the patient. Practically the following must be determined: 1. If the patient has borne children, the presence or absence of labor injury and its sequences; if single, the history of some accident which might cause local displacement. Under either circumstance an examination must be made, and all abnormalities corrected. 2. The presence or absence of ovarian congestion, temporary or permanent, as indicated by pain and tenderness in the usual situation before the flow begins,—so-called ovarian dysmenorrhœa. 3. The occurrence of hypogastric pain, which seems to indicate an anteflexion in excess of the normal. 4. The state of the general health,—*a*, the muscular nutrition; *b*, the richness of the blood; *c*, the state of the nervous system and the tension of the vessels; *d*, the functions of digestion.

Dysmenorrhœa may occur in the robust or the delicate, in the full-blooded or the anæmic. It may have the characteristics applied to the ovarian form of this affection or may be simply excessive monthly pain in the abdomen and back, each occurring in the above class of cases. The scantiness or fulness of the flow does not have much influence on the pain, although the former state is more frequently present. Nor does the amount of hemorrhage bear any relation to the general condition of the patient. The varying general conditions demand varying treatment, if permanent relief for the patient is sought after. The local symptoms, save as indicated above, require the same methods of relief in all cases. Hence practically the disease is not local but general. Monthly pain is not the disease; the general state of the system is a disease, of which the dysmenorrhœa is a local expression.

General Treatment.—a. The writer is convinced of the necessity of securing good muscular development. The muscles of the back and abdomen require particular attention. Any one may observe in many cases the tendency to stooping and curvature of the lower half of the spinal column. The gait of the patient and the position assumed in the sitting posture show this. Until full muscular strength is restored, the muscles should be supported by external means. The so-called abdominal supporters are of service. Any firm girdle that presses upon and supports the abdomen *below* the umbilicus will answer. Due attention must be paid to the selection of garments and corsets that will not crowd the viscera into the lower abdomen, and hence overstrain the abdominal muscles. Light gymnastics, calculated to develop the muscles necessary for the support of the spinal column posteriorly and the abdominal contents anteriorly, are absolutely essential.

b. It goes without saying that any anæmia, if present, must be carefully treated. The medicinal means to accomplish the desired result are familiar to all. Hygienic and dietetic methods will yield better and more lasting results than drugs. It is not necessary to enter into details regarding measures obvious to all.

c. The state of the nervous system and the degree of vascular tension are to be considered. All are familiar with the "charged" state of the nervous system at the approach of the menstrual period. The flux does not relieve this state in many, or but temporarily, and during the interval between the flows it persists. High arterial tension is an exponent of this condition, and the remedies that relieve it lessen the nervous erethism. Hence, too, drugs are not essential, though temporarily all powerful. The cases can be divided into two classes,—the well-developed and full-blooded, and the anæmic with relaxed muscles.

The first must be submitted to all influences that subdue the nervous system. It

is obvious that all kinds of excitement which appertain to our life in the cities must be eschewed, particularly the social excitements that allure the young, the mental excitements of high-pressure education, and the excitation of rich and stimulating and improperly-selected food. Means to secure these ends are likewise familiar to all, but the writer would lay particular stress on the selection of a proper diet. Tea or coffee must be limited or excluded. The rheumatic or gouty diathesis form a marked indication. The constituents of the urine afford a clue, and the occurrence of urates and uric acid persistently in excess is a guide to one system of dietetic regimen.

Change of climate may be considered here. Residence at the sea-side or in the mountains contribute to the general health. But many whose general health is very good are relieved of monthly suffering by a change to the sea. The writer recalls one patient who for eighteen to twenty days of the month was able to endure great exertion in social and domestic duties, and who was the admiration of her friends, on account of the appearance of good health. Four days of the month she suffered torments, which required ether and other means to alleviate, and another week was occupied in recovering from the exhaustion of pain and depression of drugs. Without any diminution in her labors, by residence at the sea, even at a fashionable place, with its exactions, she was always comfortable at her monthly periods. Such cases deserve climatic treatment, as much as cases of asthma or other affections.

The drugs which the writer has found of service in the states indicated are nitroglycerin, the bromides, and antipyrin. One drop of a one per cent. solution of nitroglycerin, continued for months, seems to have gradually lessened vascular tension and nervous erethism. Ten grains of the bromide of sodium three or four times daily accomplished the same result. It is of more service in the cases that show ovarian congestion at the period, or are accompanied with melancholia, or only mental depression shortly before and at the time of the flow. Three grains of antipyrin three times daily for a long time is indicated for the same reasons as the other remedies, whether ovarian dysmenorrhœa be present or absent, if reasons do not exist for its discontinuance. In the anæmic or weak for two weeks of the month iron may be substituted. It reduces arterial tension. Regarding the use of other tonics the writer is not positive. The only one to consider is nux vomica and strychnine. In some, and especially if the muscles are atonic, the nervous system depressed, and the blood reduced, while prostration readily ensues on exertion, it is of service in ascending doses. In others small continuous doses suffice.

The state of the digestion and the action of the bowels must be examined into. They often furnish lines for special treatment. The alkaline laxative waters are of service in lithæmic states with high tension.

Treatment of the Monthly Period.—Antipyrin answers well in all cases. Three to five grains may be given every half-hour until the severe pain is relieved, and then every two, three, or four hours. It not only relieves pain, but allays the perturbed nerves. It is often of advantage to anticipate the pain by administering the drug at longer intervals, for three or four days, especially if there is much nervousness. For the same reasons, and in ovarian dysmenorrhœa, the writer begins the use of the bromide three or four days before the flow, in doses of 10 or 20 grains every two, three, or four hours. They may be combined with antipyrin.

In many cases the tongue becomes furred, loss of appetite, and nausea and vomiting ensue. The patient claims to be "bilious." At the same time that antipyrin is given, calomel, in doses sufficient to secure free movements of the bowels, may be used.

Of course other medicinal means avail.* For the past two years the above methods have been enough to secure relief and satisfaction, and the writer is firmly convinced that opiates should not be used.

CASE I.—A young woman, 24 years of age, never strong from birth, had been a constant sufferer from twelve years of age. She had been under the care of a number of physicians, who particularly treated her locally by mechanical methods, by dilatation, etc., without relief. The monthly attacks were increasing in severity, and when I saw her first the period was gone through with about as follows: For three or four days before the flow there was excessive nervousness, increasing in severity up to the day after the flow began. At this time not only was the nervousness shown in exquisite sensitiveness to noises or the slightest extraneous irritations, but marked choreiform movements had begun. Twenty-four hours before, vomiting would commence, and

* One of the writer's patients is always relieved within two hours by the fluid extract of viburnum.

with it a severe headache. She had to be put to bed, and at the end of the twenty-four hours frightful pelvic pain, or pain in the lower part of the abdomen, set in. This pain was so severe as to require frequently the use of anodynes, and always of hot applications constantly, and at the height of the attack the patient would lie in bed with the limbs drawn up, tossing about and twitching all over; when under observation the most violent choreiform movements were brought on. There were no emotional disturbances, but the hands and feet would be very cold at the end of the twenty-four hours. From pain there was severe depression of the vital forces. As soon as the vomiting set in the appetite, which had been failing for three or four days, would be gone entirely, and for the next four days the patient would go without food. After five or six days of this torment the pain would pass off, but the nervous symptoms would continue, while the prostration was extreme. If able to go out in a week, the patient was fortunate. Usually ten to fourteen days of every month were spent in this manner. She was always worse in the winter, because of confinement of city life, lowered vital force, etc. The plan of treatment that the writer has indicated has been so successful that last winter one day in bed would suffice. During the summer the period would pass off, with slight amount of depression, for twenty-four hours.

CASE II.—The patient was 28 years of age. She would be confined for a week during the month, and suffer great pain. It was said that the anteflexion was well marked; the pain was undoubtedly indicative of ovarian congestion. The medicinal means just suggested were used. Antipyrin at the first of the attack, with tonics in the intervals, brought her quite up, but recovery did not become complete until an external supporter was used, and the back muscles, which showed from a commencing curvature of the spine great loss of power, were toned up and strengthened by the use of gymnastics, massage, and electricity. The sister was 27 years of age; had always suffered from monthly pain, but never had any hemorrhage. She had been treated here and in other cities, both locally and generally. Her general condition was very good, however. She is bright, active, and of good tone. The muscular powers have not been weakened, and it seems that the pain is possibly due to aggravated anteflexion with ovarian congestion. The prolonged use of counter-irritants, and the use of antipyrin at the intervals and during the attack, have been of the utmost service, and practically she has returned to full health, save in fulness of menstrual flow.

METRIC PRESCRIBING AND POSOLOGY.

BY A. L. BENEDICT, A.M., M.D.*

NOW that the latest edition of the United States Pharmacopœia, with its official adoption of the metric system, is about to be made the practical guide of pharmacists, this system of prescribing and dispensing assumes a fresh interest and an added importance. Naturally enough, its friends and opponents are urging for and against it various practical and theoretical considerations. Theoretically, we are asked to admire the symmetry of a system of denominate numbers whose units of length, weight, volume, and area are all closely related, and whose prime unit, the metre, is the ten-millionth part of a quadrant of the earth's circumference. Theoretically, we are expected to be shocked because more recent measurements have shown that the standard metre is not exactly the ten-millionth of this distance. An attempt has been made to arouse enthusiasm over a prospective reform, or over an adherence to the monuments of the past, and a few men have even gone so far as to appeal to race prejudice to produce a hostility to the metric system.

These arguments, however, are of little practical value. The fact that the metre is a simple decimal fraction of the terrestrial quadrant, or the fact that it varies therefrom by a trifling error, does not affect the narrow range of quantity with which the physician has to deal. The logical connection between the gramme and the unit of land measurement is not of significant advantage in prescribing, but it certainly is a great convenience to have an exact and universal correspondence between measures of weight and volume, instead of the approximate equality of the minim of water and the grain, and of the pint and the pound avoirdupois. As the result of a considerable experience with and investigation of the metric system, including the expressions of opinion of over eighty physicians, who replied to a circular addressed to the two hundred and sixty members of the Erie County (New York) Medi-

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cal Association* the following practical arguments *pro* and *contra* have been elicited :

CONTRA.	PRO.
Too much trouble to learn the metric system.	The simplicity of a decimal system repays much trouble.
Danger of mistakes in prescribing.	No physician should use the metric system unless competent to do so.
Danger of mistakes in dispensing.	Experience shows this danger to be largely imaginary. Graduates of pharmacy colleges are well drilled in the metric system.
Metric nomenclature is too technical for popular use.	Neither is the apothecary's system popular, nor the officinal nomenclature of drugs. Technicalities in prescribing are rather an advantage than a disadvantage.
Nearly all British, and most American, physicians use the apothecary's system.	The British apothecary's system is not quite the same as ours. The metric system is in practical and general use in all civilized countries of importance except the United States and the British empire. It is gaining ground in the United States, and is almost universally used in purely scientific investigations.
Bottles are made to hold a certain number of ounces. If the medicine-bottle is not full, patients may be dissatisfied.	Bottles can be obtained to hold a convenient number of cubic centimetres. A one hundred cubic centimetre mixture leaves only space enough to allow thorough shaking in a four-ounce bottle.

The foregoing are substantially all the practical arguments for and against the metric system of which the writer has heard or read. His personal opinion, after four years' experience, is that the metric system is simple, practical, and safe, and that no one who genuinely uses it is likely to abandon it. The choice between the metric and the apothecary's system must be, for the present, an expression of individual judgment, and it will be some years before conservatism is overcome.

A number of physicians are in the habit of remembering doses in grains and minims, writing them in grammes or cubic centimetres, and making the total bulk of the prescription sixty grammes, corresponding to fifteen doses of four cubic centimetres each. This method is probably the easiest by which one system is transposed into the other, but it is merely a specious, not a genuine, use of the metric system, and its advocates are martyrs to a good cause, lending their influence to the support of the metric system and enduring all the trouble which can possibly attach to the use of it without enjoying the advantages which accrue to those who think as well as write in decimal units. Instead of writing a prescription for fifteen doses, it is much better to order ten, twenty, or thirty doses, since those numbers involve a simple multiplication and the moving of the decimal point. A series of experiments, in which different patients have counted the number of teaspoonful doses taken from one hundred cubic centimetre mixtures, has demonstrated that five cubic centimetres is much more exactly the capacity of the average teaspoon than four cubic centimetres, and that the drachm (3.9 cubic centimetres) is too small an estimate. For example, in a majority of cases, the one hundred cubic centimetre mixture, calculated to contain twenty doses, lasted for twenty-one or twenty-two doses; whereas, if the drachm were equal to a teaspoonful, the number of doses would have been twenty-six. The other approximate domestic equivalents of metric quantities are the tablespoonful, fifteen to twenty cubic centimetres; the pint, five hundred cubic centimetres; and the drop (not minim), three centigrammes.

Success in internal medication depends largely upon a knowledge of doses, and metric prescribing should rest upon a familiarity with the metric doses of drugs, not upon a translation of grains and minims into centigrammes.

Posology may be mastered in two ways,—first, by mere force of memory, connecting the name of a drug with a certain number of grains or centigrammes; secondly, by assigning it, according to its powerfulness, to an approximate position in a scale, just as we translate conceptions of heat and cold into degrees. The apothecary's system of weights and measures, with its irregular leaps from one unit to another, and with the necessity of using various fractions of a grain, is not well adapted to such a method of remembering doses. In the metric system, however, we have a regular series of steps leading from one unit to another, and fractions—except as every decimal unit is a fraction of the next higher—are almost altogether avoided. It is neither a con-

* See report in *Buffalo Medical and Surgical Journal* for August, 1892.

fession nor an accusation of ignorance to say that, with some exceptions, the dose of a drug is so much a matter of approximation that it varies from half to double the amount taken as a standard, and this variation is without reference to age, sex, or obvious impressionability of the patient, but merely on account of unappreciable causes. It is, therefore, manifestly an impossibility to bind a dose to a fixed point in the scale. The arbitrary amount chosen to represent the efficacy of a drug is rather a stake at which the dose is tethered by a longer or shorter bond.

The first efforts of a medical student to learn dosage are attended with the same difficulties which would be encountered in going to a strange market-place to purchase unfamiliar wares with equally unfamiliar coin. After a time conceptions of value and price, or of powerfulness and dose, become coordinated. A physician habituated to the use of the apothecary's system, and attempting to change to the metric system, is in the position of a traveller buying goods in which he has formerly dealt, but paying for them in foreign currency. His previous experience is of advantage in giving him an estimate of value, but he is hampered with the necessity of learning to think in new units, or else of complicating each therapeutic or commercial calculation with a tedious arithmetical transposition. If we were to instruct a child, ignorant alike of things and money, or a foreigner reasonably familiar with the values of different commodities in his own country, but unused to our cents and dollars, we might adopt some such means as the following: A cent is a small thing; it will buy a stick of candy or a postal-card; it will do to give to an organ-grinder. Two cents will buy a postage-stamp and send a letter anywhere in the country, or it will pay a mile's passage over the lines of any railroad that is not extortionate. Five cents will purchase what Philadelphians call a "soft drink," and is the usual street-car fare. Ten cents will buy a pound of one of the cheaper meats. With twenty-five cents you can have your hair cut, send a telegram, buy a handkerchief, or tip a waiter. A dollar will secure a fair seat in a theatre, a good meal, or a passable shirt. Five dollars will pay for a week's board, if you will not ask more than the necessities and a few of the comforts of life. By the aid of such commonplace illustrations, a facility in the use of our decimal monetary system could be acquired, and by a similar comparison of drugs with the metric scale, dose values may be learned in the easiest and best way. The following table presents what may be termed posological landmarks:

	Alkaloid.	Mineral.
.0005 (½ milligramme)	Hyoscina.	
.001 (1 milligramme)	Atropina.	P.
.005 (5 milligrammes)	Apomorphina.	$HgCl_2$.
.01 (1 centigramme)	Morphina.	$AgNO_3$.
.50 (50 centigrammes)	Quinina.	$BiONO_3$.
1.00 (1 gramme)	Cinchonina.	KBr.
10.00 (or more) (10 grammes)		$MgSO_4$.

The following rules pertaining to the pharmaceutical preparations of drugs are the result of considerable labor in compilation, and in the verification and correction of similar rules, which have been published in various journals. In such general statements it is manifestly impossible to designate a dose which will be the best of each particular drug, yet the dose given will be found to be neither too small to be effective, nor so large as to be dangerous. If, in spite of the great pains taken, mistakes have occurred, the writer will be greatly obliged to any one who will point them out.

Pilula, no. i to iii, except pil. opii and pil. phosphori, no. i. to ii.

Trochiscus, no. i to iii. Twenty might be given without danger, except troch. glycyrrhizæ et opii and troch. morphinæ et ipecacuanhæ, of which not more than ten should be given. Troch. potassii chloratis and troch. sodii santoninatis could probably be given without bad results, in doses of twenty, but the former drug should never be given as a constitutional medicine, on account of the danger of nephritis and the superiority of other salts, and the latter should be eliminated from our list of drugs on account of its solubility, and santoninum used instead.

Mel, elixir, mucilago *ad libitum*.

Abstractum (twice the strength of the crude drug), .03 to .05, except abs. jalapæ, abs. podophylli, abs. valerianæ, .50 to 1.00.

Extractum fluidum (same strength as crude drug). Of stomachics and astringents, 1.00 to 4.00; of most other drugs, 1.00. Of colchicum, conium, hyoscyamus, sabinum, sanguinaria, senega, gelsemium, cannabis indica, capsicum, .10 to .50. Of aconitum, veratrum viride, belladonna, stramomium, scilla, digitalis, .03 to .15.

Trituratio (ten times the weight of a powerful drug). It is to be hoped that all pharmaceutical preparations will some time be made standard dilutions or concentrations, not of any specified drugs, but of all drugs for which the preparation would be available.

Aqua, decoctum, infusum, 25.00 to 60.00; except aq. ammoniæ fortior, used only externally, aq. ammoniæ, .50 to 1.50; aq. creosoti and aq. amygdalæ amaræ, 5.00 to 15.00; inf. digitalis, 5.00 to 15.00.

Mistura, 15.00 to 30.00; except mist. magnesiæ et assafœtidæ, 1.00 to 2.00; and mist. rhei et sodæ, 2.00 to 5.00.

Acetum, 1.00 to 4.00; except acet. opii, .50 to 1.50; acet. sanguinariæ, 1.00 to 10.00.

Syrupus, 5.00 to 15.00; except syr. ferri iodidi and syr. calcis, 1.00 to 4.00; except also syr. ferri bromidi, syr. ferri, quininæ et strychninæ phosphatum, syr. scillæ, syr. ipecacuanhæ (as expectorant), 2.00 to 4.00; syr. ipecacuanhæ, as an emetic, follows the general rule.

Liquor (no general rule). All containing arsenic are one per cent., and are given in a dose of .10 to .50. All containing iron, .15 to 1.00 (except liq. ferri subsulphatis and liq. ferri tersulphatis, which are not usually given internally); liq. ammonii acetatis, liq. potassii citratis, liq. pepsini, 15.00 to 50.00; liq. potassæ, liq. sodæ, liq. sodæ chloratæ, 1.00 to 4.00; liq. magnesii citratis, liq. calcis, 100.00; liq. iodi compositus, .30. Other liquors are used externally.

Tinctura, non-poisonous, 2.00 to 4.00; poisonous, .25 to 1.00; except tr. aconiti, tr. veratri viridis, .05 to .30.

Spiritus, 2.00 to 4.00. The alcoholic beverages are usually given in larger dose.

Vinum, 4.00 to 15.00; except vin. opii and vin. antimonii, .50 to 1.50, and vina colchici (sem. et rad.), .05 to .50.

Oleum volatile, .10 to .25; except two containing cyanogen, ol. amygdalæ amaræ and ol. sinapis, .01. Volatile oils, which are used as distinct therapeutic agents, such as ol. terebinthinæ, ol. cubebæ, ol. gaultheriæ, etc., are given in about gramme doses. Derivatives of volatile oils, like eucalyptol and menthol, are given in a little less dose than the oils themselves.

Resina, .10 to .50; except res. podophylli, .01 to .08, and res. guaiaci and res. copaibæ, .50 to 1.50.

Oleo-resina, .03 to .05; except oleo-res. lupulini, .10 to .50; oleo-res. cubebæ, .25 to 2.00; oleo-res. aspidii, 2.00 to 400.

Extractum, poisonous, .01 to .02; non-poisonous, .03 to .05. This rule is not reliable, and there are many exceptions. It is unfortunate that abstracts, which are practically standardized extracts, are so few in number.

Glyceritum, glycerinum itself, about 5.00; the others *ad libitum*.

Oleum expressum, 10.00 to 25.00; except ol. phosphoratum (one per cent.), .05 to .30; ol. tiglii, .01 to .05.

Confectio, pulvis, massa, no useful rule can be given.

A knowledge of the botanical relationship of drugs, contrary to a reasonable expectation, affords almost no clue to their therapeutic and toxic powers. Chemical information, on the other hand, is of the utmost value in posology, as the appended list of rules will illustrate. In general, the dose of a compound is determined by the more powerful radicle or element. Thus salol, which is the salicylate of phenol, cannot be given with safety in the same amount as other salicylates, its dose being nearly as small as that of carbolic acid. The derivatives of the benzine ring, C_6H_6, illustrate very well the intimate relation of dosage and chemical constitution. Carbolic acid, C_6H_5OH, has a dose of .01 to .20. Resorcin, hydroquinine, and pyrocatechin, which have two hydroxyl radicles instead of one connected with the ring, and all of which correspond to the empirical formula $C_6H_4(OH)_2$, are given in doses of .10 to .75. Benzoic acid, $C_6H_5(COOH)$, salicylic acid $(C_6H_4(OH)\text{-}(COOH)$, gallic acid $C_6H_2(OH)_3(COOH)$, are given in doses of from .40 to 2.00. Doubtless, when the chemical relations of acetanilide, antipyrin, quinine, phenacetin, etc., are better known, their similarity of action and narrow dose range will be explained.

DOSE RULES.

Dilute mineral acids and undiluted fruit acids, .25 to 2.00.

Hydrogen, potassium, sodium, and ammonium salicylates, benzoates, bromides, acetates, citrates, tartrates, and bitartrates (except that dilute instead of strong hydrobromic acid is meant), .50 to 2.00. Corresponding lithium salts in about half that dose.

Mercuric salts, strong arsenical preparations, gold salts, .001 to .005. All liquid arsenical preparations are one per cent.

Gallic and tannic acids, extracts of vegetable astringents, .25 to 1.00; fluid extracts of vegetable astringents about 1.00 to 4.00; tinctures, about 2.00 to 4.00.

Astringent salts of iron, .05 to .20; non-corrosive iron preparations, .10 to .50. The arsenical antidotes, ferri oxidum hydratum, and ferri oxidum hydratum cum magnesia are given *ad libitum*.

Liquid preparations of iron, .50 to 2.00

(except those of the sulphates which are for external use).

Mercurous salts and preparations of elemental mercury, .01 to .50, the danger being not from the size of a single dose but from repetitions of even minute doses.

The doses of the (almost) insoluble mineral astringents form an ascending scale, beginning with cerii oxalas, .20; passing zinci oxidum and zinci carbonas, .30; bismuthi subnitras and bismuthi subcarbonas, .50 to 2.00; and terminating in creta preparata, 2.00 to 5.00.

The emetic sulphates also form a series. Hydrargyri subsulphas flavus, .10 to .25; cupri sulphas, .25 to .50; zinci sulphas, .50 to 2.00.

The extracts of poisonous drugs and copper, silver, and zinc salts, used as nervines, are given in doses of .01 to .02.

Salts of iron, zinc, copper, and lead, used as astringents, are given in doses of .05 to .20.

Most salines used to modify the urine are given in doses of .50 to 1.00.

Most salines used as cathartics are given in doses of 10.00 to 20.00.

Most of the new hypnotics are given in 1.00 to 2.00 doses.

Most of the new (synthetic) antipyretics are given in doses of from .25 to .50.

All officinal ethers, .50 to 4.00.

ENTEROCLYSIS OF ICE-WATER IN THE TREATMENT OF INTESTINAL DISEASES OF CHILDREN.

By Julius L. Salinger, M.D.*

THE object of this paper is to call attention to a mode of treatment of diseases of the intestines not generally known or practised. The treatment of diseases of the bowel by water is by no means of recent origin. G. Simon (*Archiv für Klinische Chirurgie*, von Langenbeck, xv., Heft I., pp. 122, 123) was, however, the first to prove that water injected through the rectum, rapidly diffused itself through the bowel even to the small intestines, without harm to the patient. The method in which this can best be accomplished is to place the patient on the left side and elevate the hips. The knee-elbow position is also a very good one to accomplish the same object. Mader (*Allgem. Med. Centralzeitung*, Berlin, 1887, No. 27) proved upon the cadaver that by injections of even less than two quarts of water, the ileo-cæcal valve was reached, and that by a forced injection of the same quantity of water, even the bowel beyond the valve has been reached. The method which, however, is to be preferred is that in which the water is allowed to slowly flow into the bowel, and attempts made to retain the water in the bowel for some little time. A simple rectal syringe is all that is required and not the elaborate irrigator which has been patented in Germany by Komp. Forced injections should never be used, nor should the water be allowed to flow quickly into the bowel, as unpleasant and even dangerous symptoms have been seen to follow this procedure, such as headache, abdominal cramp (principally in the region of the umbilicus), vomiting, and severe symptoms of shock. No death has ever followed this method, as far as I have been able to learn. It is, however, a procedure which should always be carried out with care, and it should always be remembered that harm can ensue in the hands of an inexperienced and ignorant operator.

Various substances, antiseptic and otherwise, have been injected into the bowel. My plan has been to use ice-water. With its use I have observed the most beneficial effects in the treatment of intestinal diseases of children. My experience has been largely with children, and I have made an effort to treat only cases by this method which have proved very obstinate, and where other remedies usually useful have failed. A fair illustration is the following:

Baby S. L., aged 2, has been troubled with vomiting and diarrhœa for two weeks. Vomiting took place immediately after taking food, and was accompanied by considerable retching. The stools varied from seven to twelve daily, and were at first tarry and offensive, later turning to yellow and a light clay color. The patient rapidly lost flesh and strength, and refused to take food. Fever was constantly present, ranging from 100° to 102° F., but very irregular. The patient was given the ordinary chalk mixture, bismuth, tannic acid, opium, and salol, without the slightest effect. The only remedy that relieved the symptoms at all was salol. Under the use of this remedy the stools were reduced to five, and even four, daily. It had, however, not the slightest effect on the temperature. Taking into consideration that the ordinary remedies had proven ineffective, the unwillingness and perhaps inability of

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the child to swallow, and the amount of fever present, I ordered injections of ice-water, beginning at first with a pint and increasing to a quart every four hours. This treatment was not at all painful, and the child offered no opposition. An ordinary fountain-syringe was used, the nozzle introduced into the rectum and the ice-water allowed to slowly trickle into the bowel. As the water came away, solid particles of fæces about the size and shape of a split pea were seen in the evacuation. The water had a slimy look and was quite offensive. The temperature taken before and after the injection showed a fall of 3°,—from 102° to 99°. The child seemed relieved and soon fell asleep. This treatment was repeated every four hours, until the child had five injections. On the second day the patient had three stools, which had lost their offensiveness and were becoming more solid. On the following day only two stools. The temperature never rose again above 99½° and the child took nourishment quite freely. There has been no return of the diarrhœa.

This case is not an isolated instance. I have nine other cases to report in which ice-water injected into the bowel was the only remedy employed. All were speedily relieved and cured by this procedure. There is no necessity of detailing the cases, as the history quoted above is a fair illustration of all the rest. All began with vomiting and purging, more or less fever, anorexia, insomnia, etc. Rapid wasting is also a marked symptom of this affection and constitutes one of the chief dangers. Naturally there is no difficulty as to diagnosis, we are dealing with acute gastro intestinal catarrh or cholera infantum. This disease is due to an accumulation of fæces in the intestinal tract undergoing decomposition, leading to large accumulations of bacilli and their ptomaïnes, which are subsequently reabsorbed and taken into the system, and produce a fixed set of symptoms already enumerated. The principal cause of the entire trouble is then in the intestine, and the chief aim of the treatment consists in removing the cause. It has been demonstrated that this cannot be accomplished by means of cathartics. It can, however, be safely undertaken by copious injections of ice-water according to the method already described. Very few children will resist or offer opposition, and the method is very easy of application. The quantity of water that should be employed will vary with the age of the child. About one pint of water for a child six months old will be found to be sufficient. This amount should be increased to a quart for children two years of age. It is rarely necessary to give larger quantities than this.

This affection is much less frequent in breast-fed children than in children that are artificially fed. It is, therefore, imperative in treating children that are brought up by the bottle, and especially in warm weather, to give them nothing but sterilized milk.

That ice-water injections materially reduce the temperature I have had occasion to observe in other diseases. In a case of scarlet fever, in a child 9 years old, this treatment was used to reduce the temperature. After injecting one quart of ice-water, the temperature fell from 105½° to 101°, and remained so for six hours. Local sponging and bathing did not cause nearly the same fall of temperature, the maximum fall being about 1½°. In enteric fever of adults, I have also seen the same decrease in temperature following the injection of ice-water. The Germans have been using injections of water by the bowel for some time in typhoid fever, and it is quite the rule to reduce temperature in this way.

I have used ice-water injections largely, and have never seen any ill effects follow. On the contrary, the patient seemed to enjoy the cooling effects of the ice-water. For the treatment of intestinal diseases of children, and especially for the midsummer diarrhœas, accompanied by vomiting, loss of flesh, and fever, it seems almost a specific. It has, to my mind, some very great advantages. The digestion of an already enfeebled stomach is not interfered with by prescribing remedies which are often in themselves difficult to digest and assimilate. Besides, the remedy may, in itself, be vomited, and so no benefit obtained. Secondly, the bowel is mechanically cleansed of masses of irritating, decomposing fæces, containing bacilli and their ptomaïnes, which, by their reabsorption into the system, give rise to dangerous, and often fatal, consequences. Lastly, the temperature is materially reduced by a harmless and certain therapeutic agent.

NEPHRECTOMY IN A CHILD OF TWO YEARS—RECOVERY.

By Marie B. Werner, M.D., Philadelphia, Pa.

IN carefully studying the literature on the treatment of malignant renal disease in children, it will be found that very little hope

of a permanent cure is entertained, and while there are cases on record which show the patients have recovered from the operation, there has been an early return in some other organ. It is with the view for mutual study that I present this case before the Society to-night.

Katie Kelly, born August 2, 1890; of slow development; began walking at eighteen months; at twenty months her mother noticed a lump in her left side, of which the child made little or no complaint; its rapid growth, however, made it necessary to seek medical advice. The child was brought to the Medical Aid about two and a half months after the first indication of the swelling. The child was fairly well nourished; very peevish; abdomen markedly distended; a globular swelling could be mapped out in the left splenic region. The mother stated that her bowels were regular; urine free; appetite good. A diagnosis of tumor of left kidney or spleen was made. After this she was taken to many of the hospitals. Some surgeons offered to operate, but the parents were unwilling to give their consent. On August 1, 1892, I was asked to see the child, and found a marked change for the worse. The child was extremely emaciated, the abdomen enormously distended, its large veins showing the pressure on the portal circulation. The thoracic cavity was encroached upon, making breathing difficult; urine high-colored and scant. The abdominal wall was so tense that it was impossible to gain an outline of the growth, the distention so uniform that it suggested the presence of fluid, adding to this the transmission-wave distinctly felt on percussion; the only means of relief seemed quite evident,—namely, incision and drainage. I asked Dr. J. Price in consultation, who thought with me that drainage was indicated. After a few days of hot baths, followed by alcohol and oil, and liberal feeding, we decided to operate.

August 7.—Patient chloroformed by Dr. Anna M. McAllister, assisted by Dr. J. Price. I made a small incision in the left lumbar region. The skin, muscle, and fascia receded under the knife like overstretched rubber, and disclosed nothing but tumor, not a drop of fluid. An exploratory-needle, attached to an aspirator, was plunged into the tumor, but nothing came. It was now deemed best, since the capsule had been injured, to remove the growth entirely. Rapidly enlarging the incision, and enucleating it from its bed and bowel attachments, ligating the renal vessels and ureter, the kidney with its mass was severed; scarcely an ounce of blood was lost. Placing a warm sponge over the intestines, the sutures were placed in the abdominal wall, enclosing peritoneum, muscles, fascia, and skin, their ends held by hæmostatic forceps. The intestines were carefully examined, and about six inches of the colon was severed from its mesentery. This was repaired, carefully uniting the peritoneal edges on both sides. Two rubber drains were now placed in the retro-peritoneal space, the field of operation was carefully cleansed, and the sutures rapidly tied. Dressings and bandages applied, the child was placed back into bed, reaction being prompt and complete. Recovery was unattended by a single unpleasant symptom. Urine was passed about eight hours after operation, the first being slightly stained with blood. The kidney continues to do ample duty. Bowels moved naturally in twenty-four hours, and the first few days kept regular,—two or three actions daily. After this, occasional doses of magnesia became necessary, owing to an almost exclusive milk diet; the appetite became ravenous, and the child rapidly lost its pinched, emaciated look. One remarkable feature was that she seemed to stand an intensely hot spell, which set in the day following the operation, better than many previously well babies. She was somewhat aided in this by being placed in her coach and set on the sidewalk in a shady place.

During the third week she was taken down to Atlantic City to the Children's Sea-Shore House. A stay of five days made a remarkable change for the better. The mother, however, could not content herself any longer, so she brought the child home, in spite of advice to the contrary. This made two journeys during the third week, which apparently did no harm. She is now able to walk about, and refuses to lie down, except to sleep; appetite continues good, kidney and bowels acting normally.

In the consideration of this operation there are several items of great importance. The necessity of making a clean stump, consisting of only the vessels and ureter, becomes of vital importance, for if any part of the capsule or kidney structure is left, it becomes an incomplete operation, as well as a fertile soil for the continued proliferation of the malignant growth. Of no less importance is placing the abdominal sutures, the incision being large, before repairing the intestinal injuries. The reason is obvious, the stitches form a bar-

Operators and References.	Sex and age.	Diagnosis.	Method of operation and date.	Condition after operation.	Result.	Remarks.
Hueter, of Greifswald, *Zeitschrift f. Chirurgie*, 1878, Bd. ix. p. 527.	Female, 4 years.	Malignant tumor of either spleen or ovary.	Operation, July 4, 1876; incision over site of tumor; excessive hemorrhage from blood-vessels of the kidney; death during operation.	.....	D.	Examination of tumor proved it to be a paranephritic sarcoma, starting from the hilus of the left kidney.
Jessop, of Leeds, *Lancet*, 1877, i. p. 889.	Male, 2 years, 3 months.	Malignant swelling in left hypochondrium.	Operation, June 7, 1877; lumbar incision; secured vessels and ureter with whip-cord ligature; moderate venous hemorrhage.	Made a good recovery; ends of ligature left to act as a drain; moderate oozing.	R.	Encephaloid degeneration; kidney and growth weighed 16 ounces; a return, 8 months later, ended fatally.
Kocher, of Berne, *Lancet*, 1877, ii. p. 312.	Male, 2½ years.	Tumor of left kidney.	Operation, September 27, 1877; median incision; ligated *en masse* with catgut; considerable hemorrhage during operation.	Secretion of urine good; 24 hours later acute sepsis.	D.	Death 2 days after operation; cause, septic peritonitis; the growth was an adeno-sarcoma of the left kidney, the size of the child's head.
Barker, of London, *Med. Chir. Transact.*, 1880, lxiii. p. 181.	Female, 12 years.	Floating right kidney undergoing malignant degeneration.	Operation, December 23, 1879; median incision; ligated in two portions, then *en masse*; moderate hemorrhage.	Fever, vomiting, dyspnœa; death 45 hours after, caused by embolism of the lung.	D.	Tumor proved a small round-celled sarcoma of the right kidney; weight, 30½ ounces.
Czerny, of Heidelberg, *Med. Wochenschr.*, 1881, No. 31, p. 422.	Female, 11 months.	Movable tumor of left kidney.	Operation, August 2, 1880; median incision; ligated in two portions, then *en masse*; hemorrhage moderate during operation.	Marked collapse; later vomiting, diarrhœa, tympanitis; death after 2½ days; peritonitis.	D.	Tumor an adenoma, size of a child's head; autopsy showed some sero-purulent fluid between the intestinal coils.
Hicquet, of Lüttich, *Centralblat f. Chirurgie*, 1882, No. 14.	Female, 6 years.	Sarcoma of left kidney.	Operation, September 18, 1881; median incision; ligated *en masse*.	All healed in 4 weeks; no return in 4 months after.	R.	Tumor; fibro-cyst of capsule; weight, 10½ pounds; death 1½ years after operation.
Ollier, of Lyon, *Acad. de Méd.* September, 1883.	Child, 4 years.	Sarcoma of kidney.	Operation, 1882; abdominal incision.	.....	D.	Tumor, sarcoma of kidney; died 1 hour after operation; cause, shock.
Heath, of London, *British Med. Journ.*, 1882, ii. p. 100.	Young child.	Sarcoma of kidney.	Operation, July 12, 1882; moderate hemorrhage.	Death 10 hours after from collapse.	D.	
Reczey, of Pesth, *Central. f. Chirurg.*, 1883, No. 31.	Male, 5½ years.	Primary sarcoma of the kidney.	Operation, 1882; abdominal incision; wide-spread adhesions; incomplete operation.	Death third day; septic peritonitis.	D.	Tumor, medullary cancer; weight, 4 kilos.
Rawdon, of Liverpool, *Med. Chirurg. Journ.*, September 2, 1882.	Female, 1½ years.	Tumor of left kidney.	Operation, 1882; incision, linea alba.	Death after 15 hours; collapse; carbolic-acid poisoning.	D.	Round-celled sarcoma of left kidney.
Godlee, of London, *Med. Times and Gazette*, 1884.	Male, 1 year, 10 months.	Tumor of right kidney.	Operation, August, 1883; incision as advised by Langenbuch; no great loss of blood.	Recovery.	R.	Round-celled and spindle-shaped sarcoma, weighing 1 pound; death from return in the right iliac fossa and scrotum 7 months after.
König, *Verhand. d. Deutsche Gesell. f. Chirurg.*, 1885, p. 68.	Female, 6 years.	Sarcoma of kidney.	Operation, 1883; abdominal incision.	Recovery; discharged after twenty-first day.	R.	Large myxo-sarcoma; return after 4 months; death in 5 months.
Schönborn, *Deutsche Zeitschrift f. Chirurgie*, 1889, Bd. xxix. p. 592.	Female, 7 years.	Sarcoma of right kidney.	Operation, 1883; abdominal incision.	Recovery.	R.	Sarcoma right kidney; no return after 4 months.
Meredith, *London Med. Times and Gaz.*, 1884, p. 627.	Female, 4 years.	Rapidly-growing tumor of the kidney; urine normal.	Operation, 1884; abdominal incision ligated in two portions; marked collapse during operation.	Died three days after.	D.	Tumor, round-celled sarcoma; weight, 3½ pounds; post-mortem shows the vena cava inclosed in the ligature; metastasis in lungs, liver, and lymphatics.
Bardenheuer, *Mitteilung d. Kölner Burgerhospital*, Heft v., 1890.	Male, 2¼ years.	Tumor of kidney noticed 1½ months; malignant.	Operation, October 4, 1884; complicated crossed incisions; resection of twelfth rib; wound cavity packed with iodoform gauze.	Discharged December 3, 1884; a small granulating surface still present.	R.	Tumor, carcinoma of right kidney, weighing 735 grammes; fatal return 2 months after discharge.
Pughe, of Liverpool, *Med. and Chirurg. Journ.*, 1885.	Female, 2½ years.	Sarcoma of kidney noticed 2 years.	Operation, 1885; abdominal incision.	Died seven days after from strangulation of intestine.	D.	
König, *Deutsche Zeitschr. f. Chir.*, Bd. xxix., 1889, p. 594.	Male, 2 years	Sarcoma of kidney noticed 8 months.	Operation, 1885; abdominal incision.	Discharged well after 30 days.	R.	Spindle-celled sarcoma; fatal return 3½ months later.

Croft, of London, *Lancet*, 1885, i. p. 936.	Male, 3 years.	Tumor of the kidney; hæmaturia.	Operation, February 5, 1885; lumbar, with cross incision; vessels ligated with silk, ureter with catgut.	On fifth day right-sided epididymitis, with formation of abscess; healed after 6 weeks; discharged.	R.	Round-celled sarcoma of the right kidney size of a man's fist.
Dandois-Soppart, *Bull. des l'Acad. Roy. de Méd. de Belg.*, No. 12, p. 839.	Male, 25 months.	Sarcoma of kidney noticed 4 months.	Operation, 1885; abdominal incision over site of tumor.	Recovery.	R.	Large alveolar sarcoma.
Witzel, *Deutsche Zeitschr. f. Chirurg.*, Bd. xxiv., 1886.	Female, 4 years.	Malignant tumor of the kidney 6 weeks' duration.	Operation, August 29, 1885; lateral incision; many adhesions; operation incomplete.	Death in 6 days from peritonitis	D.	Myxo-sarcoma of the right kidney.
Trendelenburg, *Deutsche Zeitschrift f. Chirurg.*, Bd. xxiv., 1886.	Male, 9 years.	Tumor of right kidney.	Operation, November 16, 1885; lateral incision.	Recovery; discharged in 4½ weeks.	R.	Tumor, adeno-carcinoma of right kidney; weight, 2000 grammes; January, 1886, could find no sign of return.
H. L. Taylor, of Ohio, *Amer. Journ. Med. Sciences*, 1887.	Female, 1 year, 8 months.	Tumor in right lumbar region.	Operation, October 9, 1886; Langenbeck's incision; not much bleeding.	2 hours after operation patient died from shock.	D.	Tumor weighed 830 grammes; spindle-celled sarcoma of right kidney.
König, *Deutsche Zeitschr. f. Chir.*, Bd. xxix., 1886.	Male, 2¼ years.	Sarcoma of kidney.	Operation, 1886; abdominal incision.	Discharged cured in 24 days.	R.	Sarcoma.
Bardenheuer, *Mitteil. des Kölner Bürgerhospitals*, Heft v., 1890.	Male, 3 years.	Malignant tumor of left kidney.	Operation, April 6, 1886; complicated crossed incisions; resection of twelfth rib; cavity of wound packed with iodoform gauze.	Condition good for 10 days, when increased temperature and peritonitis set in, ending fatally 4 days later.	D.	Round-celled sarcoma, weighing 4 pounds; death, acute peritonitis 14 days after operation.
König, *Deutsche Zeitschr. f. Chirurg.*, Bd. xxix., 1886.	Female, 1¾ years.	Sarcoma of the kidney.	Operation, 1887; abdominal incision.	Death on same day from collapse.	D.	Sarcoma of the kidney; metastasis found in lungs at autopsy.
Alsberg, *Deutsche Med. Wochenschrift*, No. 40, 1887.	Female, 5 years.	Sarcoma of right kidney.	Operation, March 30, 1887; incision from left border of eleventh rib to near the outer third of Poupart's ligament; this is the so-called Von Bergmann's incision.	Patient made a good recovery.	R.	Spindle- and round-celled sarcoma of right kidney; fatal return after 11 weeks; metastasis in liver and lungs; remaining kidney normal.
G Fischer, *Deutsche Zeitschr. f. Chirurg.*, Bd. xxiv., 1886.	Male, 4½ years.	Sarcoma of left kidney.	Operation, June 20, 1888; Von Bergmann's incision; a small portion of the tumor remained, which the marked collapse prevented removing; moderate bleeding.	Recovery; 4 weeks later a rise in temperature; some abdominal enlargement. F. concluded to operate again, July 26, using Simon's incision; hopeless; again partial recovery.	R.	Tumor, spindle- and round-celled sarcoma, 2855 grammes; death 4 months later from a return of the disease.
Gussenbauer-Czerny, *Archiv f. Kinderh.*, Bd. xi., 1889–90.	Male, 3½ years.	Malignant tumor of left kidney.	Operation, October 24, 1888; method not given; moderate hemorrhage.	Child died soon after operation from shock.	D.	The tumor proved to be a carcinoma of the left kidney, leaving but a small portion of kidney-tissue in the upper lobe.
H. Schmid, *Verhand. d. Versamm. der Gesellschaft der Deutsche Naturf. u. Aerzte.*, 1890.	Child, 6 months.	Sarcoma of kidney.	Synopsis of paper read before meeting fails to give particulars.	Recovery.	R.	Tumor, sarcoma the size of a child's head.
A. V. L. Brokaw, *Med. News*, 1891, p. 313.	Male, 3 years, 8 months.	Sarcoma of right kidney.	Operation, November 15, 1890; incision along the margin of the quadratus lumborum, midway between crest of ileum and last rib; ligature, Staffordshire knot; abdomen flushed, peritoneum closed, gauze tampon packed into deep portions of the wound.	Suffered from shock 5 hours; blood lost during operation considerable; removal of gauze tampon third day.	R.	Capsule of tumor broke during enucleation: some of its jelly-like contents escaped into the abdominal cavity; January 26, child taken again ill; died February 2; metastasis in liver and stomach.
Marie B. Werner.	Female, 2 years.	Tumor of spleen or kidney noticed 4 months.	Operation, August 7, 1892; incision from border of eleventh rib to above and near the outer third of Poupart's ligament; very little loss of blood.	Uninterrupted recovery.	R.	Tumor, congenital sarcoma; weight, 8 pounds; uniform ovoid mass growing from the anterior and lower surface of the kidney, kidney enlarged; pelvis sacculated.

rier against any undue exposure of the intestines, thus aiding in keeping these organs warm, an important factor against subsequent shock. The suture ends secured by hæmostatic forceps, permit anywhere along the line of incision an opening large enough to draw out the injured bowel, which is carefully wrapped in clean gauze wrung out of warm water. The bleeding is thus taken care of, the bowel kept warm, and the injured site easy of access. In this case, the colon being torn from its mesentery, it became essential to make the repair thorough in order to avoid gangrene, using a round, sharp needle armed with fine silk, and taking only serous and subserous tissue, thus avoiding perforation of the bowel, and covering all open surfaces. The necessity for such extreme care was shown from the fact that the colon was put into action twenty-four hours after the operation.

Macroscopic examination of the tumor (eight hours after removal; weight, eight pounds) showed a uniform mass growing from the anterior and lower surface of the kidney; the capsule is easily broken, and from its interior a pulpy, grayish, or yellowish-white substance, bearing some resemblance to brain-tissue, exudes. The site of the exploratory opening is dark red, and easily broken down with the finger. The kidney is enlarged; the pelvis is sacculated.

The following letter from Dr. Lothrop gives the results of her microscopical examination of the growth:

Katie K., born August 2, 1890; tumor removed August 7, 1892; girth, 25 inches; distance from ensiform cartilage to pubis, 15½ inches; height of child, 30 inches; weight of tumor, 8 pounds; measurements of tumor, 8¼ by 5½ inches; cicatrix, 6½ inches.

"STATE HOSPITAL FOR THE INSANE,
"NORRISTOWN, PA., October 24, 1892.

"DEAR DR. WERNER:—Your tumor is most interesting, for although I kept your suggestion of encephaloid in mind, I have to tell you that it is a congenital sarcoma.

"The piece you send me consists of an outer wall or capsule, prolongations from which run irregularly through the tumor, crossing or anastomosing with one another. The interspaces thus formed are filled with a very soft substance, which, being only in loose union with the walls, readily falls out.

"Under the microscope, the walls are seen to be composed of many long, spindle-shaped

cells, with comparatively little intercellular substance.

"The centre of the spaces is occupied by a mass of necrotic cells, evidently small and round. Such small, round cells are perceptible at the margins of the necrotic mass. Between this necrotic centre and the walls, the spaces are filled with a fine reticulum containing an abundance of small, round cells.

"These cells have large nuclei, and at the most only a narrow zone of protoplasm. In many of the nuclei there is chromatolytic degeneration. The farther away the cell is from the necrotic centre the more intact it appears.

"As the walls, however, are approached, transition found from the spindle to the round cells occur. In the outlying spindle cells transverse striation may be observed.

"This striation is a sign that there was some disturbance in the early stages of development. The rapid growth is also characteristic, and I think it probable that you found the blood-vessels much filled. The soft mass which exuded upon the capsule being broken was probably necrotic, and very likely in part lymphadenoid in character. Do you remember if there was any sign of pus? Perhaps the necrosis had not become purulent.

"I hope that my description is clear, but if there are any points which you would like to have me explain more fully please let me know.

"I think the history of the mother's physical condition during the pregnancy might be of interest.

"Yours very truly,

"HARRIET E. LOTHROP."

Nephrectomy for abnormal growths in children is regarded differently by various authors. Those opposed base their opposition, first, upon the high mortality of the operation; secondly, because the degeneration is usually of a malignant type; thirdly, if recovery does take place, the almost certain return in some other organ. Those in favor of operation are usually surgeons who have saved one or more cases, and their reasons for operating are, first, that it is not always possible before operation to make a distinct diagnosis regarding the character of the growth; secondly, that when the tumor proves to be malignant its removal will often relieve painful complications even if a return be inevitable. This does not include congenital cystic degeneration, where, as a rule, both kidneys are involved.

The appended table will prove of interest in the summing up. A collection of thirty-one nephrectomies for abnormal growths of the kidney occurring in children at or under twelve years of age. Of these thirty-one we have sixteen recoveries and fifteen deaths, making an immediate mortality of 51.6 per cent. Of the sixteen there were eight who succumbed to a return of the disease, five at or under four months (one of these at eleven weeks), three at or under eight months. One was reported to have died one and a half years after the operation; cause not stated. In one no return after three months, another at four months, and four not stated. As each one can see the result of the case reported to-night he will agree that there is so far no indication of a return. This table does not include that case of Little's, which was in reality a post-mortem report. The ultimate results are not encouraging, but there is certainly something in making even the few months of the doomed sufferer comfortable, especially as the knowledge and technique of these cases becomes clearer. This is particularly noteworthy in connection with some of the cases in the table; in one the vena cava was tied by mistake, in others fragments of the tumor were left behind, aiding very materially towards a so-called recurrence. The case of Fisher was remarkable, in that he recognized having failed to remove a small portion of the tumor, but owing to the collapsed condition of the patient left it, only to find it necessary to make a new incision five weeks later with hopeless results. How many chances for life that patient lost by incomplete work can only be conjectured from the results of future and completed work.

REPORT OF A CASE OF RIGHT-ANGLED DEFORMITY OF KNEE, RESULTING FROM TUBERCULAR ARTHRITIS.

BY JAMES F. E. COLGAN, A.M., M.D.*

MRS. F. S., aged 22, presented herself at the Orthopædic Department of the Jefferson Medical College Hospital, April 27, 1892, complaining of a stiff knee. On examination it was found that the leg was flexed at an angle of ninety degrees, and was partially anchylosed.

From the patient the following history was obtained: Father has phthisis and is of a

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rheumatic diathesis. The history of her mother is indefinite; she died in childbirth. A cousin has coxalgia.

The patient first noticed the trouble in January, 1892, when she observed that the knee was a little enlarged; there was not much pain at first. The swelling increased in size, causing her to go to bed, where she remained for three months, the pain being severe all this time. During the entire time the patient was in bed the knee was maintained in a comfortable position by supporting it upon pillows in a right-angled position. When she arose from her bed the knee was in the partially anchylosed condition as when she appeared at the hospital.

This case, like the great majority of chronic joint affections, occurs in a patient with a distinct tubercular family history. The father and a cousin are sufferers from tubercle, while the history of the mother is very indefinite.

When the patient came to the hospital there was a slightly enlarged knee-joint, temperature was normal, the patella was firmly adherent to the external condyle of the femur. There was an undue contraction of the semimembranosus, semi-tendinosus, and the biceps. The very slight motion present was that which was permitted by the ligamentum patellæ. Flexion and extension terminated by a sudden checking; further extension was prevented by the tibia striking against the immovable patella, while flexion was terminated by the ligamentum patellæ becoming fully extended.

The history of the case indicates that there had been a tubercular synovitis, which after the tubercular matter was absorbed, caused an agglutination of the surfaces of patella and femur.

Several attempts were made to break up the adhesions by passive motion and forcible manipulation, but without avail. As the patient was adverse to an operation, in the early part of April, 1892, Dr. W. J. Hearn attempted to free the patella by means of sudden blows of a mallet. As this was unsuccessful, it was determined to lay the joint open, which was accordingly done, May 5, 1892.

Professor H. Augustus Wilson made an incision on the external aspect of the knee; through this opening the constricting bands uniting the tibia and femur were loosened. The patella was freed from its calcareous attachment to the condyle of the femur by means of an osteotome, and the limb was placed in a straight extended position. The wound having been thoroughly cleansed, and drainage by strands of catgut being provided for, the lips of the incision were brought together with sutures, and an antiseptic dressing was applied. A plaster-of-Paris dressing was applied to the limb, in order to keep the leg in the corrected position.

The plaster-of-Paris dressing was made in two sections, one of which enveloped the foot and leg, the other the thigh. Hooped pieces of iron, retained in position by layers of plaster-of-Paris bandages, connected the two sections, allowing access to the wound without disturbing the position of the knee.

There was primary union of the wound. Sutures were removed May 11. She left the hospital May 31, a new plaster-of-Paris dressing being then applied.

The patient reported at the hospital, June 11, 1892. The part was perfectly well; there was no discharge from the wound; the limb was in the corrected position,—*i.e.*, leg in a straight line with the thigh. She used crutches, and a light plaster-of-Paris dressing ensheathed the whole limb.

On July 15 the plaster-of-Paris dressing was abandoned, and no additional support was found necessary. The patient walked without crutches, with a freedom that denoted an entire absence from pain or inconvenience other than a stiff knee.

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*SOME NOTES ON THE CORNEAL ASTIGMATISM IN TWO HUNDRED EYES MEASURED WITH THE OPHTHALMOMETER OF JAVAL, IN COMPARISON WITH THE TOTAL SUBJECTIVE ASTIGMATISM AFTER COMPLETE MYDRIASIS.**

By G. E. de Schweinitz, M.D.†

THE ophthalmometer of Javal and Schiötz requires no introduction. Its advantages as a practical instrument are everywhere recognized, and even those who look upon its readings with misgivings are not inclined, I think, to disregard it entirely or set it aside in the lumber-room. True, it has sometimes suffered from unduly enthusiastic advocacy, but plenty of conservative estimates

* Read before the Philadelphia County Medical Society, October 26, 1892.

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of its undoubted value are extant, and may be consulted for trustworthy information.

It will be interesting for a moment to give a brief *résumé* of the rise of ophthalmometry with this instrument in the United States. To Dr. Swan M. Burnett, of Washington, belongs the credit of having been the first one in this country to advocate its use, and to demonstrate its practical importance, in a paper entitled "Ophthalmometry with the Ophthalmometer of Javal and Schiötz, with an Account of a Case of Keratoconus," which appeared in 1885.* Two years later his treatise on astigmatism was published, containing a description of the instrument and of its importance as a means of measuring the corneal astigmatism. One year later he recorded an exhaustive analysis of the refraction of more than five hundred healthy human cornæ examined with the ophthalmometer of Javal and Schiötz;† and in the discussion which followed this paper, Dr. Henry D. Noyes praised the ophthalmometer, stating that it was his habit to employ it in every case where it was necessary to inquire into the refraction of the eye. In his work on diseases of the eye there is an excellent description of the instrument and the method of using it. In the years which have followed, we find papers on the subject of ophthalmometry with this instrument by H. D. Speakman,‡ by Koller,§ and an earnest advocacy of its employment by Roosa,‖—an advocacy which has never ceased, and which has never been couched in words of an uncertain tone.

In November, 1891, Dr. F. W. Ring¶ published a good account of the ophthalmometer and its uses, based upon personal conversations with Tscherning, Bull, of Paris, and Javal, and upon notes selected and compiled from the "Mémoires d'Ophthalmométrie." At the forty-second annual meeting of the American Medical Association, held in Washington, May, 1891, Dr. Burnett placed upon record further contributions to keratometry, reviewing his previous work, and reiterating his favorable opinion of the ophthalmometer. In the present year articles upon this subject have been written by E. Swasey,** Roosa, Würdemann,†† Van Fleet,‡‡ and others; while Valk, in the new edition of his "Errors of Refraction," gives a careful description of the ophthalmometer of Javal, and records a table of comparative examinations.

Some unfavorable comments have been published, together with a series of tables not unlike the one which I hope to present this evening, by Dr. J. H. Woodward;§§ but even in this paper, although objections are made to certain inaccuracies, according to the belief of this author, he frankly admits that the ophthalmometer is a useful adjunct, and helps to point the way to the diagnosis of astigmatism, being especially satisfactory when this refractive defect is of high degree.

The most recent communication upon the subject in this country are the papers of A. E. Davis.‖‖ containing, as it seems to me, the best practical directions for using the instrument accurately. I have not attempted to give references to the many foreign papers upon this subject; any one interested will find quite a complete bibliography in Javal's "Mémoires."

Thus we see that from the publication of Dr. Burnett's paper in 1885 up to the present time numerous communications have appeared in this country, many of them strongly advocating the employment of this instrument.¶¶

Practically there has been little or no dissent from the views which Burnett advocated nearly eight years ago, and it seems eminently proper that Javal should characterize him, which I am sure we are all glad to do, as the champion of ophthalmometry in America.

The cases which I present for your consideration this evening comprise the last two hundred patients who came in private practice for an examination of refractive defects, exactly in the order in which they presented themselves. Each case, after the usual tests for visual acuity, the amplitude of accommodation, and the balance of the external ocular muscles,

* *Archives of Ophthalmology*, vol. xiv.

† *Transactions of the American Ophthalmological Society*, 1888.

‡ *Archives of Ophthalmology*, vol. xix., 1890, and *New York Medical Record*, vol. xxxvii., 1890.

§ *Journal of the American Medical Association*, 1890, xv. 380 to 383.

‖ *Medical Record*, April 19, 1890; *New York Medical Journal*, March 28, 1891; *Medical Record*, March 26, 1892.

¶ *Ophthalmic Record*, November, 1891.

** *Boston Medical and Surgical Journal*, March 10, 1892, cxxvi. pp. 232-236.

†† *Journal of the American Medical Association*, September 3, 1892.

‡‡ *New York Medical Journal*, July 9, 1892.

§§ Ibid., July 16, 1892.

‖‖ Ibid., September 10, 1892.

¶¶ It should be stated that Dr. C. Weiland has made a study of what he believes to be the main defects of the ophthalmometer of Javal from a mathematical standpoint, and has published his research in the *Medical News*, 1892, lx. pp. 626-629.

was examined with the ophthalmometer of Javal and the reading carefully recorded. The eyes were then subjected to complete mydriasis, with atropine, hyoscyamine, or cumulative instillations of homatropine, and a comparison made with the previous results. In the cases under thirty years of age, hyoscyamine or atropine was employed; in those over this age cumulative instillations of homatropine. In each instance a complete paralysis of the ciliary muscle was obtained, because I am one of those who believe that this can be done with a strong solution of homatropine when properly employed, and, as is well known, I have full support in this belief from such careful observers as Risley, Randall, and Jackson.

From these observations the tables were arranged, as will be seen, by placing first the case number, then the sex of the patient, followed by the age, the ophthalmometer reading, the glass selected after a mydriatic, the difference in the axes, and, finally, the difference in the amount of astigmatism, provided there was any difference in these respects. In recording the ophthalmometer reading, it might have been written as Davis has suggested, for example, "Astigmatism with the rule 1 D axis 90° +, or axis 180° —." Again, "Astigmatism against the rule 180° + or 90° —." In order to save space, however, this repetition has been omitted, and, for example, the ophthalmometer reading is recorded thus: O. S. 3 D axis 180; glass selected after a mydriatic,—2.75^{c} axis 180, and not, as might have been done following the suggestion just quoted, O. S. 3 D axis 90 +, or axis 180 —; glass selected after a mydriatic,— 2.75^{c} axis 180. The tables follow. I desire to thank my assistant, Dr. John Haden, for help in making the records.

Many of the degrees of astigmatism are weak, representing .25 D, .37 D, and .50 D, or, in other words, indicating that a reading was made in fractions of a dioptry, according to the amount of overlapping of the steps of the reflector. Now, it is a difficult matter to assure one's self that the corneal images of the reflector are exactly in apposition, and there is no doubt that it is easy to commit an error of .25 or .37 D when the first adjustment of the ophthalmometer is made. To a certain extent this depends upon the skill of the observer, but it none the less introduces a small element of doubt. Woodward, whose article has been referred to, writing concerning this point, says, "In the appended reports I wish to be understood. I don't pretend to accurately bisect the image of one-half of one step of the reflector. When the reading is, for example, .25 or .75, I wish to convey the idea that the overlapping of the reflector was, as nearly as I could estimate it, one-quarter or three-quarters of the step." This is, of course, a fair statement, and applies in the present instance. I presume no one would pretend to estimate exactly one-quarter of the step. Still practice develops reasonable accuracy, just as it does in a cataract extraction, where we are accustomed to estimate the width of a millimetre or even of a fraction of a millimetre.

Analysis of the Tables.—There were one hundred and fifty eyes in which the ophthalmometer recorded astigmatism according to the rule. In one hundred and thirty-four of these eyes the axis of the cylinder found with the aid of mydriasis corresponded with that determined with the instrument; in sixteen eyes there was a difference in this respect, the least difference being five degrees, the greatest seventy-five degrees. In the latter case the ophthalmometer recorded distinctly a slight astigmatism (.25 D) according to the rule, but the patient accepted positively the same degree of astigmatism, but with the axis of the glass contrary to the rule.

In thirty-five eyes the amount of astigmatism found with the instrument exactly corresponded with that revealed by mydriasis, but in one hundred and fifteen eyes there was a difference in this respect. In six of them the mydriatic correction was slightly greater in amount than that found with the ophthalmometer,—four times, .12 D; and twice, .25 D. In the remaining one hundred and nine eyes the ophthalmometer reading gave a greater degree of astigmatism than the mydriatic measurement,—twenty-five times, .12 D; sixty-five times, .25 D; four times, .37 D; fourteen times, .50 D; and once, .75 D; or, in other words, the average error was a little less than half a dioptry, being exactly .2613 D.

There were twenty-one eyes in which the ophthalmometer recorded astigmatism contrary to the rule. In eighteen of these eyes the axis of the cylinder found with the aid of mydriasis corresponded with that determined by the instrument; in three eyes there was a differenee in this respect, the least difference being five degrees, and the greatest fifteen degrees. The amount of astigmatism was identical in nine eyes, but was different in twelve eyes. In eight it was more with mydriasis than the ophthalmometer

TABLE I.—*Astigmatism according to the Rule.*

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected after mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
2	F.	46	O. D. .50 D axis 75.	O. D. $+.50^{s}\bigcirc+.62^{c}$ axis $75\frac{6}{6}$.	None.	.12 D.	.12 D more than ophthalmometer reading.
			O. S. .50 D axis 120.	O. S. $+1^{s}\bigcirc+.25^{c}$ axis $120\frac{6}{6}$.	None.	.25 D.	
3	F.	25	O. D. .50 D axis 90.	O. D. $+.62^{c}$ axis $90\frac{6}{6}$.	None.	.12 D.	
			O. S. .50 D axis 105.	O. S. $+.62^{c}$ axis $105\frac{6}{6}$.	None.	.12 D.	.12 D more than ophthalmometer record.
4	M.	15	O. D. 1 D axis 75.	O. D. $+2^{s}\bigcirc+.75^{c}$ axis $75\frac{6}{6}$.	None.	.25 D.	
			O. S. 1 D axis 90.	O. S. $+2^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
6	M.	40	O. D. 2 D axis 175.	O. D. -1.75^{c} axis $175\frac{6}{6}$.	None.	.25 D.	
			O. S. 3 D axis 180.	O. S. $+.75^{s}\bigcirc-2.75^{c}$ axis $180\frac{6}{6}$.	None.	.25 D.	
7	M.	27	O. D. .50 D axis 105.	O. D. $+.50^{s}\bigcirc+.25^{c}$ axis $105\frac{6}{6}$.	None.	.25 D.	
			O. S. No astigmatism.	O. S. $+.75^{s}\bigcirc+.12^{c}$ axis $75\frac{6}{6}$.	.....	.12 D.	
9	M.	42	O. D. 1.50 D axis 90.	O. D. $+1.25^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. Blind.	O. S.	.....	.....	Detachment of retina.
10	F.	13	O. D. .50 D axis 90.	O. D. $+1^{s}\bigcirc+.50^{c}$ axis $90\frac{6}{6}$.	None.	None.	
			O. S. .50 D axis 75.	O. S. $+.75^{s}\bigcirc+.62^{c}$ axis $75\frac{6}{6}$.	None.	.12 D.	
11	F.	18	O. D. .50 D axis 105.	O. D. $+4.25^{s}\bigcirc+62^{c}$ axis $105\frac{6}{6}$.	None.	.12 D.	.12 D more than ophthalmometer record.
			O. S. .75 or 1 D axis 75.	O. S. $+5^{s}\bigcirc+.62^{c}$ axis $75\frac{6}{7.5}$.	None.	.13 D.	
13	F.	34	O. D. .50 or .75 D axis 90.	O. D. $+50^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. .50 or .75 D axis 105.	O. S. $+.50^{c}$ axis $105\frac{6}{6}$.	None.	.25 D.	
14	M.	46	O. D. .50 D axis 90.	O. D. glass rejected $\frac{6}{6}$.	.....	.50 D.	
			O. S. No astigmatism.	O. S. glass rejected $\frac{6}{6}$.	.....	.....	
15	M.	31	O. D. 1 or 1.25 D axis 15.	O. D. $+.50^{s}\bigcirc+1^{c}$ axis $15\frac{6}{6}$.	None.	.25 D.	Astigmatism contrary to rule.
			O. S. .50 or .75 D axis 150.	O. S. $-.50^{c}$ axis $150\frac{6}{6}$.	None.	.25 D.	
18	M.	48	O. D. .75 D axis 90.	O. D. $+.50^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. .75 D axis 90.	O. S. $+.50^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
21	F.	30	O. D. 1 D axis 90.	O. D. $+2.50^{s}\bigcirc+.75^{c}$ axis $105\frac{6}{6}$.	15°.	.25 D.	
			O. S. 1 D axis 75.	O. S. $+2.50^{s}\bigcirc+.87^{c}$ axis $90\frac{6}{6}$.	15°.	.12 D.	
22	F.	28	O. D. 2.50 D axis 150.	O. D. $-.75^{s}\bigcirc-2.25^{c}$ axis $150\frac{6}{6}$.	None.	.25 D.	
			O. S. 2 D axis 30.	O. S. $-.50^{s}\bigcirc-1.75^{c}$ axis $30\frac{6}{7.5}$.	None.	.25 D.	
23	M.	17	O. D. .75 D axis 90.	O. D. $+1.25^{s}\bigcirc+.50^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. .75 D axis 105.	O. S. $+1.25^{s}\bigcirc+.50^{c}$ axis $105\frac{6}{6}$.	None.	.25 D.	
24	F.	54	O. D. 1 D axis 90.	O. D. $+.87^{c}$ axis $90\frac{6}{6}$.	None.	.12 D.	
			O. S. .50 or .75 D axis 90.	O. S. $+.62^{c}$ axis $90\frac{6}{6}$.	None.	.12 D.	
25	F.	19	O. D. 1 D axis 105.	O. D. $+.75^{c}$ axis $105\frac{6}{6}$.	None.	.25 D.	
			O. S. .50 or .75 D axis 75.	O. S. $+.25^{s}\bigcirc+.50^{c}$ axis $75\frac{6}{6}$.	None.	.25 D.	
26	F.	22	O. D. 1 D axis 15.	O. D. $-2^{s}\bigcirc-.87^{c}$ axis $15\frac{6}{6}$.	None.	.12 D.	
			O. S. 2.50 D axis 165.	O. S. $-5^{s}\bigcirc-2.25^{c}$ axis $165\frac{6}{12}$.	None.	.25 D	
27	M.	24	O. D. 75 D axis 100.	O. D. $+1.25^{s}\bigcirc+.62^{c}$ axis $100\frac{6}{6}$.	None.	.13 D.	
			O. S. 1 D axis 80.	O. S. $+1.25^{s}\bigcirc+.62^{c}$ axis $80\frac{6}{6}$.	None.	.38 D.	
29	F.	21	O. D. 1 D axis 90.	O. D. $+.75^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. 1 D axis 80.	O. S. $+.75^{s}\bigcirc+.87^{c}$ axis $75\frac{6}{6}$.	5°.	.12 D.	
30	M.	45	O. D. .75 or 1 D axis 90.	O. D. $+1^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. .50 D axis 90.	O. S. $+.75^{s}\bigcirc+.25^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
31	F.	55	O. D. .75 D axis 105.	O. D. $+1^{s}\bigcirc+.50^{c}$ axis $105\frac{6}{6}$.	None.	.25 D.	
			O. S. .50 D axis 75.	O. S. $+1^{s}\bigcirc+.50^{c}$ axis $75\frac{6}{6}$.	None.	None.	
32	F	23	O. D. .50 D axis 90.	O. D. $+2^{s}\bigcirc+.50^{c}$ axis $90\frac{6}{6}$.	None.	None.	
			O. S. 1.50 D axis 110.	O. S. $+.50^{s}\bigcirc+.75^{c}$ axis $125\frac{6}{6}$.	15°.	.75 D.	
33	F.	30	O. D. .50 D axis 90.	O. D. $+.75^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	.25 D more than ophthalmometer record.
			O. S. .50 D axis 90.	O. S. $+.75^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	.25 D more than ophthalmometer record.
34	M.	21	O. D. .50 D axis 90.	O. D. $+1.25^{s}\bigcirc+.37^{c}$ axis $90\frac{6}{6}$.	None.	.13 D.	
			O. S. .50 D axis 90.	O. S. $+1.50^{s}\bigcirc+.37^{c}$ axis $75\frac{6}{6}$.	15°.	.13 D.	
35	F.	38	O. D. .50 D axis 90.	O. D. $+1.25^{c}\frac{6}{6}$.	.....	.50 D.	
			O. S. .50 or .75 D axis 105.	O. S. $+1.25^{s}\bigcirc+.25^{c}$ axis $105\frac{6}{6}$.	None.	.50 D.	
36	M.	44	O. D. 1 D axis 90.	O. D. $+.50^{s}\bigcirc+.50^{c}$ axis $90\frac{6}{6}$.	None.	.50 D.	
			O. S. 1 D axis 105.	O. S. $+.50^{s}\bigcirc+.75^{c}$ axis $90\frac{6}{6}$.	15°.	.25 D.	
38	F.	31	O. D. .75 D axis 90.	O. D. $+.50^{c}$ axis $90\frac{6}{6}$.	None.	.25 D.	
			O. S. .75 D axis 105.	O. S. $+.62^{c}$ axis $90\frac{6}{6}$.	15°.	.13 D.	
39	F.	36	O. D. .50 D axis 90.	O. D. $+.50^{s}\bigcirc+.50^{c}$ axis $105\frac{6}{6}$.	15°.	None.	
			O.S. none or slight .25 D axis 150.	O. S. $+1^{s}\bigcirc+.50^{c}$ axis $150\frac{6}{6}$.	None.	.25 D.	As against the rule .25 D more than ophthalmometer reading.

TABLE I.—*Astigmatism according to the Rule.*—(Continued.)

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected after Mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
40	F.	40	O. D. very slight .25 D axis 105.	O. D. + 1^s ⊃ + .25^c axis 165$\frac{6}{5}$.	60°.	None.	
			O. S. very slight .25 D axis 105.	O. S. + 1^s ⊃ + .25^c axis 180$\frac{6}{5}$.	75°.	None.	
41	F.	23	O. D. .75 D axis 105.	O. D. + .75^s ⊃ + .50^c axis 105$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 or .75 D axis 75.	O. S. + 1^s ⊃ + .62^c axis 75$\frac{6}{5}$.	None.	.12 D.	
42	M.	23	O. D. 3.50 D axis 5.	O. D. + 1.50^s ⊃ — 3^c axis 5$\frac{6}{5}$.	None.	.50 D.	
			O. S. 2 D axis 160.	O. S. — 1.50^c axis 160$\frac{6}{5}$.	None.	.50 D.	
44	F.	19	O. D. .50 or .75 D axis 75.	O. D. + 1^s ⊃ + .25^c axis 75$\frac{6}{5}$.	None.	.50 D.	
			O. S. .50 or .75 D axis 90.	O. S. + 1^s ⊃ + .25^c axis 90$\frac{6}{5}$.	None.	.50 D.	
45	M.	62	O. D. 1 or 1.25 D axis 120.	O. D. + 2^s ⊃ + .1^c axis 120$\frac{6}{9}$.	None.	.25 D.	
			O. S. .75 or 1 D axis 60.	O. S. always amblyopic.	.....	.....	
46	F.	40	O. D. .75 D axis 75 or 90.	O. D. + 1.75^s ⊃ + .62^c axis 75$\frac{6}{5}$.	None.	.12 D.	
			O. S. .50 D axis 105.	O. S. + 1.75^s ⊃ + .25^c axis 90$\frac{6}{5}$.	15°.	.25 D.	
47	M.	33	O. D. .50 D axis 120.	O. D. + .50^c axis 120$\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 105.	O. S. + .50^c axis 105$\frac{6}{5}$.	None.	None.	
48	M.	37	O. D. .75 D axis 90.	O. D. + 2.50^s ⊃ + .62^c axis 90$\frac{6}{5}$.	None.	.12 D.	
			O. S. .50 or .75 D axis 105.	O. S. + 2.25^s ⊃ + .50^c axis 105$\frac{6}{5}$.	None.	.25 D.	
50	M.	26	O. D. .50 D axis 90.	O. D. + 1^s ⊃ .62^c axis 90$\frac{6}{5}$.	None.	.12 D.	
			O. S. .50 D axis 90.	O. S. + 1^s ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	None.	
51	F.	25	O. D. 3.50 D axis 10.	O. D. — .50^s ⊃ — 3.50^c axis 10.$\frac{6}{12}$.	None.	None.	
			O. S. 3.50 D axis 180.	O. S. — .50^s ⊃ — 3.50^c axis 180$\frac{6}{12}$.	None.	None.	
52	F.	25	O. D. .50 D axis 90.	O. D. + 1.25^s ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 75.	O. S. + 1.25^s ⊃ + .62^c axis 75$\frac{6}{5}$.	None.	.12 D.	
54	M.	42	O. D. .50 D axis 90.	O. D. + 3^s$\frac{6}{9}$.	.....	.50 D.	
			O. S. .50 D axis 90.	O. S. + 4^s$\frac{6}{9}$.	.....	.50 D.	
55	M.	20	O. D. .50 D axis 90.	O. D. + .75^s ⊃ + .25^c axis 90$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 D axis 105.	O. S. + .75^c ⊃ + .25^c axis 105$\frac{6}{5}$.	None.	.25 D.	
56	M.	44	O. D. .75 D axis 105.	O. D. + .50^c axis 105$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 D axis 90.	O. S. + .25^c axis 90$\frac{6}{5}$.	None.	.25 D.	
57	M.	14	O. D. 1.25 D axis 90.	O. D. + 5^s ⊃ + .75^c axis 105$\frac{6}{5}$.	15°.	.50 D.	
			O. S. 1.50 D axis 90.	O. S. + 4^s ⊃ + 1.25^c axis 90$\frac{6}{5}$.	None.	.25 D.	
58	F.	35	O. D. .75 D axis 90.	O. D. + 1.25^s ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	.25 D.	
			O. S. 1 D axis 105.	O. S. + 1.25^s ⊃ + .62^c axis 105$\frac{6}{5}$.	None.	.38 D.	
59	M.	27	O. D. 2 D axis 85.	O. D. — .75^s ⊃ + 2^c axis 85$\frac{6}{5}$.	None.	None.	
			O. S. 2 D axis 95.	O. S. — .50^s ⊃ + 1.75^c axis 95$\frac{6}{5}$.	None.	.25 D.	
60	M.	45	O. D. .50 D axis 90.	O. D. + .50^s ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 105.	O. S. + .50^s ⊃ + .50^c axis 105$\frac{6}{5}$.	None.	None.	
61	F.	12	O. D. .75 D axis 60.	O. D. + 3.50^s ⊃ + .50^c axis 60$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 D axis 90.	O. S. + 3.50^s ⊃ + .25^c axis 90$\frac{6}{5}$.	None.	.25 D.	
63	F.	15	O. D. .50 D axis 75.	O. D. + .75^s ⊃ + .25^c axis 75$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 D axis 105.	O. S. + .75^c ⊃ + .25^c axis 105$\frac{6}{5}$.	None.	.25 D.	
65	F.	41	O. D. .50 D axis 105.	O. D. + 1^s ⊃ + .25^c axis 105$\frac{6}{5}$.	None.	.25 D.	
			O. S. .50 D axis 75.	O. S. + 1^s ⊃ + .25^c axis 75$\frac{6}{5}$.	None.	.25 D.	
66	F.	40	O. D. .25 D axis 105.	O. D. + .75^s ⊃ + .25^c axis 105$\frac{6}{5}$.	None.	None.	
			O. S. .25 D axis 90.	O. S. + .75^c ⊃ + .25^c axis 90$\frac{6}{5}$.	None.	None.	
68	M.	41	O. D. 1 D axis 75.	O. D. + .50^s ⊃ + .87^c axis 75$\frac{6}{5}$.	None.	.12 D.	
			O. S. 1 D axis 105.	O. S. + .25^s ⊃ + 1^c axis 105$\frac{6}{5}$.	None.	None.	
69	F.	29	O. D. 1.25 D axis 90.	O. D. + .75^s ⊃ + 1^c axis 90$\frac{6}{5}$.	None.	.25 D.	
			O. S. 1 D axis 105.	O. S. + .75^s ⊃ + .75^c axis 105$\frac{6}{5}$.	None.	.25 D.	
70	M.	19	O. D. 2.50 D axis 95.	O. D. + 3.75^s ⊃ + 2^c axis 95$\frac{6}{5}$.	None.	.50 D.	
			O. S. 2.50 D axis 85.	O. S. + 4^s ⊃ + 2^c axis 85$\frac{6}{5}$.	None.	.50 D.	
71	F.	29	O. D. 3.50 D axis 60.	O. D. — .75^s ⊃ + 3.25^c axis 60$\frac{6}{5}$.	None.	.25 D.	
			O. S. 2 D axis 105.	O. S. + 1.75^c axis 95$\frac{6}{5}$.	10°.	.25 D.	
73	F.	33	O. D. .50 D axis 90.	O. D. + 1^s ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 75.	O. S. + 1^s ⊃ + 62^c axis 75$\frac{6}{5}$.	None.	.12 D.	
74	F.	32	O. D. 3 D axis 75.	O. D. + 2^s ⊃ + 3^c axis 75$\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 90.	O. S. + 1^s ⊃ + .37^c 90$\frac{6}{5}$.	None.	.13 D.	
75	M.	24	O. D. 1 D axis 105.	O. D. + .25^s ⊃ + .50^c axis 75$\frac{6}{5}$.	30°.	.50 D.	
			O. S. .25 D axis 105.	O. S. + .25^c ⊃ + .25^c axis 105$\frac{6}{5}$.	None.	None.	
76	F.	35	O. D. 1 D axis 105.	O. D. + 2.50^c ⊃ + .87^c axis 105$\frac{6}{5}$.	None.	.12 D.	
			O. S. .50 D axis 90.	O. S. + 2.75^c ⊃ + .50^c axis 90$\frac{6}{5}$.	None.	None.	
77	M.	23	O. D. 1.50 D axis 90.	O. D. — .50^c ⊃ + 1.50^c axis 90$\frac{6}{5}$.	None.	None.	
			O. S. 1 D axis 90.	O. S. — .25^c ⊃ + .87^c axis 90$\frac{6}{5}$.	None.	.12 D.	
78	M.	42	O. D. .75 D axis 105.	O. D. + .25^s ⊃ + .62^c axis 105$\frac{6}{5}$.	None.	.13 D.	
			O. S. .25 D axis 90.	O. S. + .50^c$\frac{6}{5}$.	.....	.25 D.	
79	M.	42	O. D. 1 D axis 95.	O. D. + .75^s ⊃ + 1^c axis 95$\frac{6}{5}$.	None.	None.	
			O. S. 1 D axis 105.	O. S. + .75^c ⊃ + .75^c axis 105$\frac{6}{5}$.	None.	.25 D.	
80	F.	12	O. D. .25 D axis 105.	O. D. + 1^s ⊃ + .37^c axis 105$\frac{6}{5}$.	None.	.12 D.	.12 D. more than ophthalmometer record.
			O. S. .50 D axis 90.	O. S. + 1.50^s ⊃ + .25^c axis 90$\frac{6}{5}$.	None.	.25 D.	

TABLE I.—*Astigmatism according to the Rule.*—(Continued.)

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected after mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
81	M.	15	O. D. .50 D axis 75. O. S. .50 D axis 105.	O. D. + .90^{c} ◯ + .25^{c} axis 75°. O. S. + .90^{s} ◯ + .25^{c} axis 105°.	None. None.	.25 D. .25 D.	
83	F.	18	O. D. 1 D axis 105. O. S. .75 D axis 75.	O. D. + 1^{s} ◯ + .62^{c} axis 105°. O. S. + 1^{s} ◯ + .62^{c} axis 75°.	None. None.	.38 D. .13 D.	
85	F.	25	O. D. 1.25 D axis 90. O. S. 1 D axis 105.	O. D. + 1.50^{s} ◯ + .87^{c} axis 90°. O. S. + 1.50^{s} ◯ + .75^{c} axis 105°.	None. None.	.38 D. .25 D.	
86	M.	37	O. D. 1 D axis 90. O. S. 1.25 D axis 105.	O. D. + 1^{c} axis 90°. O. S. + 1.25^{c} axis 105°.	None. None.	None. None.	
87	F.	12	O. D. .25 D axis 75. O. S. .25 D axis 90.	O. D. + 3.75^{s} ◯ + .25^{c} axis 75$\frac{6}{7.5}$. O. S. + 3.50^{s} ◯ + .25^{c} axis 90$\frac{6}{7.5}$.	None. None	None. None.	
88	F.	18	O. D. 1.50 D axis 90. O. S. .50 D axis 90.	O. D. + 1.25^{s} ◯ + 1^{c} axis 90°. O. S. + 2.25^{s} ◯ + .25^{c} axis 90°.	None. None.	.50 D. .25 D.	
89	F.	28	O. D. 1.25 D axis 90. O. S. 6 D axis 85.	O. D. — .50^{s} ◯ + 1^{c} axis 90°. O. S. — 3^{s} ◯ + 5.50^{c} axis 85$\frac{6}{15}$.	None. None.	.25 D .50 D.	
90	F.	35	O. D. .25 D axis 90. O. S. .25 D axis 90.	O. D. + 1^{s} ◯ + .25^{c} axis 90°. O. S. + 1^{s} ◯ + .25^{c} axis 90°.	None. None.	None. None.	
91	M.	12	O. D. .50 D axis 90. O. S. .50 D axis 90.	O. D. + .75^{s} ◯ + .25^{c} axis 90°. O. S. + .75^{s} ◯ + .25^{c} axis 90°.	None. None.	.25 D. .25 D.	
92	M.	30	O. D. 1 D axis 75. O. S. 1.25 D axis 105.	O. D. + .75^{c} axis 75°. O. S. + 1^{c} axis 105°.	None. None.	.25 D. .25 D.	
93	F.	10	O. D. .50 D axis 90. O. S. .50 D axis 90.	O. D. + 1.25^{s} ◯ + .25^{c} axis 90°. O. S. + 1.25^{s} ◯ + .25^{c} axis 90°.	None. None.	.25 D. .25 D.	
94	F.	24	O. D. 1.25 D axis 90. O. S. 1.50 D axis 95.	O. D. + 5.50^{s} ◯ + 1^{c} axis 75°. O. S. + 3.50^{s} ◯ + 1.25^{c} axis 95°.	.15°. None.	.25 D. .25 D.	
95	F.	25	O. D. 2.50 D axis 180. O. S. 2.50 D axis 180.	O. D. — 6.50^{s} ◯ — 2.25^{c} axis 180°. O. S. — 5^{s} ◯ — 2.50^{c} axis 180°.	None. None.	.25 D. None.	
97	F.	33	O. D. .25 D axis 90. O. S. .50 D axis 120.	O. D. + 1.50^{s} ◯ + .25^{c} axis 90°. O. S. + 1^{s} ◯ + .25^{c} axis 120°.	None. None.	None. .25 D.	
98	F.	25	O. D. .25 D axis 90. O. S. 1.50 D axis 90.	O. D. + 2^{s} ◯ + .25^{c} 90$\frac{6}{7.5}$. O. S. + 3 50^{s} ◯ + 1.25^{c} axis 95$\frac{6}{22}$.	None. .5°.	None. .25 D.	
99	M.	23	O. D. 2.50 D axis 90. O. S. 1.50 D axis 90.	O. D. + 7^{s} ◯ + 2^{c} axis 90°. O. S. + 7^{s} ◯ + 1^{c} axis 90°.	None. None.	.50 D. .50 D.	
100	F.	30	O. D. .50 D axis 180. O. S. .50 D axis 180.	O. D. — .50^{s} ◯ — .50^{c} axis 180°. O. S. — .50^{c} axis 180°.	None. None.	None. None.	

One case of astigmatism according to the rule occurs in Table II.

TABLE II.—*Astigmatism Contrary to the Rule.*

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected after mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
1	F.	26	O. D. 2 D axis 90. O. S. 2 D axis 105.	O. D. — 7^{s} ◯ — 2^{c} axis 90$\frac{6}{15}$. O. S. — 7^{s} ◯ — 2^{c} axis 105$\frac{6}{15}$.	None. None.	None. None.	
8	F.	25	O. D. 1 D axis 115. O. S. .50 D axis 55.	O. D. — .75^{c} axis 115°. O. S. — .62^{c} axis 55°.	None. None.	.25 D. .12 D.	.12 D more than ophthalmometer record.
37	F.	38	O. D. Astigmatism absent. O. S. 1 D axis 165.	O. D. + 1.50^{s} ◯ + .50^{c} axis 180°. O. S. + 2.25^{s} ◯ + 1.50^{c} axis 165°.	..... None.	.50 D. .50 D.	.50 D more than ophthalmometer record.
43	F.	42	O. D. 1 D axis 15. O. S. 4 D axis 170.	O. D. — .50^{s} ◯ + 1^{c} axis 10°. O. S. — 2^{s} ◯ + 4^{c} axis 170°.	5°. None.	None. None.	
49	F.	20	O. D. 2.50 or 3 D axis 125. O. S. 1 D axis 15.	O. D. — 1.50^{s} ◯ — 250^{c} axis 120$\frac{6}{7.5}$. O. S. — 3^{s} ◯ — .87^{c} axis 15°.	5°. None.	None. .12 D.	According to rule.
53	F.	24	O. D. 1.50 D axis 90. O. S. 1.50 D axis 75.	O. D. — 1.75^{s} ◯ — 1.75^{c} axis 90°. O. S. — .50^{s} ◯ — 1.75^{c} axis 75$\frac{6}{7.5}$.	None. None.	.25 D. .25 D.	.25 D more than ophthalmometer record. .25 D more than ophthalmometer record.
62	M.	40	O. D. Astigmatism absent. O. S. Astigmatism absent.	O. D. + .50^{s} ◯ + .12^{c} axis 15°. O. S. + .50^{s} ◯ + .50^{c} axis 180°.	....	.12 D. .50 D.	.12 D more than ophthalmometer record. .50 D more than ophthalmometer record.
64	M.	44	O. D. .50 D axis 180. O. S. .50 D axis 180.	O. D. + .50^{s} ◯ + .25^{c} axis 15°. O. S. + .25^{s} ◯ + .25^{c} axis 180°.	15°. None.	.25 D. .25 D.	

TABLE II.—*Astigmatism Contrary to the Rule.*—(Continued.)

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected from mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
67	F.	38	O. D. .50 D axis 15.	O. D. $+1.25^{s} \bigcirc + .75^{c}$ axis $15\frac{6}{5}$.	None.	.25 D.	.25 D more than ophthalmometer record.
			O. S. .75 D axis 165.	O. S. $+1.50^{s} \bigcirc + .87^{c}$ axis $165\frac{6}{6}$.	None.	.12 D.	.12 D more than ophthalmometer record.
72	F.	46	O. D. .50 D axis 180.	O. D. $+.50^{c}$ axis $180\frac{6}{5}$.	None.	None.	
			O. S. .50 D axis 105.	O. S. $-.50^{c}$ axis $105\frac{6}{5}$.	None.	None.	
82	F.	43	O. D. .50 D axis 15.	O. D. $+1.50^{s} \bigcirc + .75^{c}$ axis $15\frac{6}{5}$.	None.	.25 D.	.25 D more than ophthalmometer record.
			O. S. .25 D axis 165.	O. S. $+1.25^{s} \bigcirc + .25^{c}$ axis $165\frac{6}{5}$.	None.	None.	
84	F.	46	O. D. .50 D axis 135.	O. D. $+.50^{c}$ axis $135\frac{6}{5}$.	None.	None.	
			O. S. Astigmatism absent.	O. S. $+.25^{c}$ axis $180\frac{6}{5}$.	.....	.25 D.	

Two eyes with astigmatism contrary to rule are placed in Table I.

TABLE III.—*No Astigmatism with ophthalmometer.*

Case.	Sex.	Age.	Ophthalmometer reading.	Glass selected after Mydriatic.	Difference in axes.	Difference in the amount of astigmatism.	Remarks.
5	M.	49	O. D. No astigmatism.	O. D. None $\frac{6}{5}$.	.....	.....	
			O. S. No astigmatism.	O. S. None $\frac{6}{6}$.	.....	.....	
12	M.	30	O. D. No astigmatism.	O. D. $-2^{s}\frac{6}{5}$.	.....	.....	
			O. S. No astigmatism.	O. S. $-2^{s}\frac{6}{5}$.	.....	.....	
16	M.	34	O. D. No astigmatism.	O. D. $+.62^{c}$ axis $15\frac{6}{5}$.	.....	.62 D.	
			O. S. No astigmatism.	O. S. $+.50^{s} \bigcirc + .50^{c}$ axis $180\frac{6}{5}$.	.....	.50 D.	
17	M.	8	O. D. No astigmatism.	O. D. $+1.25^{s}\frac{6}{5}$.	.....	.....	
			O. S. No astigmatism.	O. S. $+1.25^{s}\frac{6}{5}$.	.....	.....	
19	M.	51	O. D. No astigmatism.	O. D. $+.75^{s} \bigcirc + .25^{c}$ axis $15\frac{6}{5}$.	.....	.25 D.	
			O. S. No astigmatism.	O. S. $+1^{s} \bigcirc + .25^{c}$ axis $165\frac{6}{5}$.	.....	.25 D.	
20	M.	37	O. D. No astigmatism.	O. D. None $\frac{6}{5}$.	.....	.....	
			O. S. No astigmatism.	O. S. $+.62^{c}$ axis $15\frac{6}{5}$.	.....	.62 D.	
28	M.	20	O. D. No astigmatism.	O. D. $+.75^{s} \bigcirc + .25^{c}$ axis $150\frac{6}{5}$.	.....	.25 D.	
			O. S. No astigmatism.	O. S. $+.75^{s} \bigcirc + .25^{c}$ axis $30\frac{6}{5}$.	.....	.25 D.	
96	F.	32	O. D. No astigmatism.	O. D. $+1.50^{s}\frac{6}{5}$.	.....	.....	
			O. S. No astigmatism.	O. S. $+1.50^{s}\frac{6}{5}$.	.....	.....	

Four cases with astigmatism according to the ophthalmometer but none with mydriasis are found in Table II., and two cases are recorded in Table I.

recorded, and in four less. The average increase in the degree of astigmatism found with mydriasis over that recorded with the ophthalmometer was less than half a dioptry, or exactly .295 D.

There were twenty-two eyes in which the ophthalmometer recorded no astigmatism. In ten of these eyes mydriasis also failed to reveal astigmatism, but in twelve an astigmatism was developed after the use of the drug, —once with the rule and eleven times contrary to the rule. The case with the rule was only .12 D, and for practical purposes may be omitted. In the remaining eleven cases the amount of astigmatism varied from .25 D to .62 D, with an average of about .384 D. To recapitulate these results, we have:

a. There were one hundred and fifty eyes with astigmatism according to the rule, with—

	Eyes.
1. Correspondence in axes in.....	134
2. Difference in axes in.....	16
	150
1. Exact correspondence in amount of astigmatism in.....	35
2. Difference in amount of astigmatism in.....	115
	150
1. Astigmatism greater with mydriatic than with ophthalmometer in.....	6
2. Astigmatism greater with ophthalmometer than with mydriatic in.....	109
	115

If to this last total the thirty-five eyes in

which there was exact correspondence in the amount of astigmatism be added, we have again a grand total of one hundred and fifty eyes.

b. There were twenty-one eyes with astigmatism contrary to the rule, with—

	Eyes.
1. Correspondence in axes in	18
2. Difference in axes in	3
	21
1. Exact correspondence in amount of astigmatism in	9
2. Difference in amount of astigmatism in	12
	21
1. Astigmatism greater with mydriatic than with ophthalmometer in	8
2. Astigmatism greater with ophthalmometer than with mydriatic in	4
	12

If to this last total be added the nine eyes in which there was exact correspondence in the amount of astigmatism, we have a grand total of twenty-one eyes.

c. There were twenty-two eyes in which the ophthalmometer recorded no astigmatism, with—

	Eyes.
1. No astigmatism found with mydriasis in	10
2. Astigmatism found with mydriasis in	12
	22
1. Astigmatism according to the rule in (only .12 D)	1
2. Astigmatism contrary to the rule in (.25 to .62 D; average, .384 D)	11
	12

d. There were five eyes in which the ophthalmometer recorded astigmatism, but with—

	Eyes.
1. No astigmatism with mydriasis in	5

In each of these eyes the astigmatism was according to the rule, and the amount .5 D. Two eyes were practically blind,—one from detachment of the retina and the other from congenital amblyopia,—and hence these are of no importance in the result:

	Eyes.
1. Astigmatism according to the rule	150
2. Astigmatism contrary to the rule	21
3. Astigmatism absent according to ophthalmometer	22
4. Astigmatism present according to ophthalmometer, but absent with mydriasis	5
5. Practically blind	2
	200

REMARKS.

1. *The Axis of the Cylinder.*—In the one hundred and seventy-one eyes in which it was possible to institute a comparison in the axes of the cylindrical glasses obtained by the two methods of measurement, there was exact correspondence in one hundred and fifty-two eyes, or in 88.9 per cent., and failure in correspondence in nineteen, or 11.1 per cent.

In regard to the eleven per cent. of failures, it should be stated that so much depends upon perfect illumination, steadiness of the patient's eyes, and, above all, upon an exact level of the two eyes, that it is more than probable that this percentage in part represents some inaccuracy of the observer rather than of the instrument. Davis* quotes a capital instance illustrating the care which must be exercised in this respect. He examined a patient in Javal's clinic, failing, however, to take the precaution to see that the patient's eyes were exactly level, and found she had an astigmatism at an axis 5° from the vertical. Javal then sat down to the instrument, sighted through the transverse slit, levelled the patient's eyes correctly, measured the astigmatism, and found the same amount that Davis had discovered, but with the axis vertical. The trial lenses confirmed his reading.

Moreover, it is a fact which has been pointed out a number of times by most careful observers that the axis of the glass determined under the mydriatic sometimes fails to correspond with that accepted by the patient after the return of accommodation. Personally, I have had little or no difficulty in this respect, but I would always adopt the mydriatic determination of the axis unless successive measurements with the ophthalmometer agreed in giving a different result from this, and then I would expect, after renewed mydriasis, to find a correspondence in the two methods; in other words, I would think my first mydriatic correction had been in error.

Finally, it should be remembered that the equation of error creeps into all methods of examination, and it seems to me not unlikely that any one of us, having determined the axis of a cylindrical glass in one hundred and seventy-one eyes under a mydriatic, would, if he repeated these examinations with renewed mydriasis, find at least a dozen eyes in which he would be inclined to alter the axis of the glass five or ten degrees from the first determination, especially in the weaker grades of astigmatism.

I am not unmindful of the occurrence of

* *Loc. cit.*

cases (one of which is recorded in the list, while several others could be quoted) in which there is a notable difference in the axes determined by the two methods; for example, the ophthalmometer giving distinctly astigmatism against the rule, and the patient accepting only, both with and without mydriasis, a cylinder with its axis according to the rule. These cases are probably explained by the presence of lenticular astigmatism, which the instrument is not capable of recognizing.

2. *The Amount of Corneal Astigmatism.*—In one hundred and seventy-one eyes in which a comparison is made between the amount of corneal astigmatism determined by the instrument and the total astigmatism under a mydriatic, there was exact correspondence in forty-four eyes, or 25.7 per cent., and failure in correspondence in one hundred and twenty-seven eyes, or 74.3 per cent.

In one hundred and nine eyes with astigmatism according to the rule, in which the astigmatism with the instrument was greater than the amount with mydriasis, the average increase was a little more than .25 D, being exactly .2513 D. In twelve eyes with astigmatism contrary to the rule, in which the astigmatism with the instrument was less than the amount with mydriasis, the average decrease was again a little more than .25 D, being exactly .295 D. This, we know from Javal's teaching, is the usual result, and that in weak astigmatism according to the rule, the ophthalmometer is from .25 to .50 D stronger than the subjective measurements with atropine. In astigmatism against the rule, the ophthalmometer is too weak by from .25 to .75 D.* On this account, Burnett has formulated the following law, to which he thinks there are only occasional exceptions: "For the total subjective astigmatism subtract .5 D from the corneal astigmatism when it is according to the rule, and add .5 D if the corneal astigmatism is against the rule." Bull, of Paris, quoted by Burnett, holds to a similar law, using, however, .75 D instead of .5 D. This Dr. Burnett considers too high, and I certainly agree with him, my own experience being that .5 D is quite sufficient to subtract from the corneal astigmatism when it is according to the rule. In fact, as I have already pointed out, in the majority of cases it seems to be somewhat less than this amount.

That there are exceptions to these rules Dr. Burnett admits, and I think every one who works with the ophthalmometer will find them. In the figures presented this evening we see that in six eyes with astigmatism according to the rule the total subjective astigmatism was greater than the corneal astigmatism measured with the instrument, and in four eyes with astigmatism contrary to the rule the amount of astigmatism revealed by the ophthalmometer was greater than that found with a mydriatic. It should be stated in regard to these cases, however, that the difference was usually .12 D and only twice .25 D. Dealing with such weak degrees of astigmatism, it is just as likely that the eye of the observer was at fault as that the instrument made an inaccurate record. Again, we have exceptions to the rule, in the fact that there was an exact correspondence in the amount of astigmatism in thirty-five eyes with astigmatism according to the rule, and in nine eyes with astigmatism contrary to the rule, Here, again, with six exceptions, the astigmatism was of low degree (.25 or .50 D). In the six exceptions, however, it was more than 1 D, and ran as high as 3.50 D.

In twenty-two eyes the ophthalmometer failed to record astigmatism, and in ten of them no astigmatism was found with mydriasis, but in twelve of them a low degree of this refractive defect was demonstrated after the use of a mydriatic (.12 to .62 D). In all of the cases in which this occurred, save one, which, for practical purposes, as has already been pointed out, may be omitted, the astigmatism was contrary to the rule, and this again agrees with the teaching which has previously been given,—namely, when no astigmatism is found with the ophthalmometer, it is very probable that there is a real astigmatism against the rule from .25 to .50 D.

These results obtained by the measurement of two hundred eyes will, I think, suffice. They have been given without bias, and inasmuch as they practically confirm those of other observers who have found this ophthalmometer exceedingly useful in the determination of corneal astigmatism, they may be accepted as an additional indorsement of the many that are already on record as to the decided value of this instrument of precision.

Even if the ophthalmometer of Javal did nothing more than give us the axis of the principal meridian with a reasonable degree of certainty, which it undoubtedly does, it would be a very time-saving and valuable in-

* See also description of the ophthalmometer by F. W. Ring, M.D., *loc. cit.*

strument in the office of the practical ophthalmologist. It has been stated that when the astigmatism exceeds 2 D, we may be certain that we are within five degrees of the true meridian or axis, and when the astigmatism is slight, there may be a possible error of ten degrees; but it is equally true that with the last model the precision is greater, and judging from my own experience, I would have a confidence in the axis of the glass attained by this method of examination equal to that which I have with subjective examination under the fullest mydriasis, and when I am able to associate the two methods of examination, I am as certain of this point as it is possible to be.

But it is certainly fair to assume that within reasonable limits, and in the vast majority of cases, the ophthalmometer gives very exactly the degree of astigmatism, and that the combined observations of a number of observers permit the formulation of a rule, like other rules subject to exceptions, which tells us very nearly how much shall be subtracted from the ophthalmometer measurement when it is a case of astigmatism according to the rule, and how much shall be added to it when it is a case of astigmatism contrary to the rule. No one claims perfection for the instrument any more than he claims perfection for any other method of examining the eye, but when the ophthalmometer is carefully used, when the light is properly regulated and evenly distributed, when the eyes are carefully levelled, and when the observer, having corrected his own refractive defect, has acquired reasonable accuracy in the manipulation of the instrument, I certainly believe, and I think these tables fairly show, that Dr. Burnett is correct in stating that it is one of the most important instruments of positive diagnosis which has been given to us since the invention of the ophthalmoscope.

I am aware that much stress has been laid upon the fact that it is not an absolutely accurate measurer of astigmatism, and that disturbing factors come into play,—*e.g.*, watering of the eye of the patient, and, as Dr. Roosa aptly calls it, "the moving of the cornea under the instrument." It is for these reasons that the examinations must be constantly repeated before making the final record or before ordering the glass, just as we would repeat a mydriatic correction until we were satisfied that we had attained the highest degree of accuracy. It would be just as unreasonable to condemn the instrument on this account as it would be to condemn cataract extraction because one does not always have a docile patient and does not always make a classical section.

It is not the purpose of the present paper to discuss a question which is of much interest,—namely, how far the use of the ophthalmometer displaces mydriatics from their function in the correction of anomalies of refraction. It is needless for me in this assembly, I think, to state that I am very far from believing that the sun of mydriasis has set, or, indeed, from believing that it ever will set. Nor do I believe that mydriasis gives a false impression of the proper axis of the cylindrical glass. I have elsewhere expressed myself very positively upon this subject, because I believe that the function of mydriasis in connection with the correction of anomalies of refraction does not alone involve paralysis of the ciliary muscle, but exercises a very much wider and more important office. I am perfectly willing to state, however, that careful work with the ophthalmometer will render the necessity for the use of prolonged mydriasis unnecessary in many cases, which, previous to a knowledge of this instrument or to any skill that may have been acquired in its use, would have been classed as examples suited to the employment of a mydriatic drug.

I cannot resist closing these remarks with a quotation from Dr. Burnett's first paper on "Ophthalmometry with the Ophthalmometer of Javal and Schiötz," partly because I feel a personal indebtedness to him in learning the use of this instrument, and partly because it gives in a nut-shell what the instrument will do and what it will not do, and hence what we may expect of it.

"The ophthalmometer does not give us the refractive condition of the eye as a whole, and furnishes no positive indication as to the existence of myopia or hypermetropia, but it gives with exactness the radius of curvature of the cornea in all its meridians; and where there is a difference, it shows the direction of the principal meridians, and we can read on the instrument the amount of the difference in dioptries and fractions. The inventors claim that a difference of .25 D can be readily detected, and my own experience would substantiate this statement. The main question is, Is it practical? I most unhesitatingly answer, Yes. Taking all things into consideration, it seems to me the most practical of all of the instruments of precision we use in the diagnosis of astigmatism."

The Therapeutic Gazette

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GENERAL THERAPEUTICS.
With special departments under the charge of
G. E. DE SCHWEINITZ, M.D.,
OPHTHALMIC AND AURAL THERAPEUTICS,
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SURGICAL AND GENITO-URINARY THERAPEUTICS.

GEO. S. DAVIS,
Medical Publisher, Box 470,
DETROIT, MICH.
Philadelphia, 714 Filbert Street.

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Leading Articles.

DIAGNOSIS AND TREATMENT OF FOREIGN BODIES IN THE CORNEA.

IN spite of the trivial nature of many of the foreign bodies which embed themselves in the corneal tissue, and the general success which attends their removal, a sufficient number of cases are upon record (no doubt many more exist which have never been published) in which, either by virtue of the fact that the foreign body has escaped notice, or because there has been some flaw in the procedure with which it was removed, serious inflammation of the cornea has occurred, resulting in permanent impairment of vision. Hence the subject of foreign bodies in the cornea, considered from a practical stand-point, has been deemed by Dr. Edward Jackson worthy of a paper before the Philadelphia County Medical Society, October 12, 1892 (*Medical and Surgical Reporter*, October 22, 1892). This communication is so full of sound advice and contains one exceedingly novel suggestion that its main points may be profitably reviewed.

In making a diagnosis of foreign bodies in the cornea, the surgeon should accept the history given by the patient as an evidence worth very little consideration in the majority of cases, partly because the patient almost invariably refers the sensation of pain produced by the intruder to some portion of the eye in which the body does not exist, and partly because in many instances the foreign body is deeply embedded in the structure of the cornea and does not touch the conjunctiva of the lid, and hence gives no evidence of its existence until secondary consequences arise. In many instances, again, patients insist upon the presence of a foreign body in the eye when such is not the case, basing their impression upon the irritation caused by an ordinary conjunctivitis.

Hence the surgeon must depend for the diagnosis of a foreign body upon direct inspection, upon focal or oblique illumination, upon the use of transmitted light, upon the interruption which the body causes in the reflex obtained from the corneal surface and upon the use of fluorescine. If the body is of sufficient size, of course there is no difficulty in its detection by an ordinary direct inspection of the eye. If, however, this fails to reveal the source of the trouble, oblique illumination is the most generally useful method of search, and, as Jackson points out, foreign bodies of light color will be seen best by focal illumination when strongly illuminated against the black pupil as a background; while, if they are dark, it is better to illuminate the iris behind them. An illuminated background against which a foreign body appears as a black speck is obtained by throwing the light into the eye with an ophthalmoscope mirror held some inches in front of it, and causing the eye to move from side to side and upward and downward.

Slight irregularities in the cornea produced by the presence of foreign bodies may be detected by placing the patient before a window, while the eyes are made to follow the uplifted finger held about one foot from the face and moved in various directions. The image of the window-bars reflected from the cornea will be broken as it crosses the spot of inequality. To accomplish the same purpose, Jackson advises that the patient shall be placed opposite a window with a large, open sky space, while the surgeon takes his position so as to

obtain the reflection of the sky from the surface of the cornea. The patient's eye is then turned from point to point, so that the reflection is obtained from all parts of the cornea in succession. If the window with clear sky space is not obtainable, a piece of plain white paper or card-board, strongly illuminated and held close in front of the eye to be examined, will furnish the desired reflex from the corneal surface. Any irregularity will cause an interruption of the reflex and be immediately noticeable. Dr. M. W. Zimmerman has made a valuable suggestion in connection with this examination of the cornea for the interruption of a reflex,—namely, that irregularities are made more prominent by carefully drying the cornea with a little absorbent cotton before the examination is undertaken. The removal of moisture does not impair the reflex from the sound cornea, but exposes irregularities in its surface or loss of its substance, which, when filled with fluid, produces almost the normal corneal reflex.

As has been known since the investigations of Straub, fluorescine colors green that portion of the cornea deprived of its epithelium, while the healthy epithelium remains unaffected by the dye. For example, the coloration takes place around a foreign body in the cornea, the foreign body itself appearing as a black dot in the centre of the green area. This is a very excellent adjuvant in discovering minute specks which have embedded themselves in the corneal tissue and are surrounded by a faint circle of denuded epithelium. It is particularly valuable in those cases in which the foreign body has been removed, and the surgeon is uncertain whether a minute particle, or, as it is often called, a "rust spot," still remains, and has been the means in many instances of relieving a patient of a foreign body which has for a long time escaped detection. Generally a concentrated alkaline solution of fluorescine is employed; for example, Gruebler's fluorescine, two per cent.; carbonate of sodium, 3.5 per cent. Jackson suggests the following formula:

> Fluorescine, gr. i;
> Sodium carbonate, gr. ii;
> Distilled water, ʒi.

A single drop of this solution is placed on the suspected cornea and the excess washed away, when, if there is any break in the epithelium, the bright green coloration will quickly appear.

Having discovered a foreign body in the cornea, the removal of it is usually a simple matter, by producing anæsthesia with cocaine and lifting the foreign substance from its bed by means of a spud. Very often, however, a fine spicule of steel so penetrates the cornea that it partly enters the anterior chamber. Its removal then becomes a difficult matter, lest the manipulations with the spud thrust it entirely through the cornea and cause it to become entangled in the iris, or even to penetrate more deeply and injure the lens. Under these circumstances it is necessary to introduce a broad needle into the anterior chamber behind the foreign substance, which acts in a twofold manner,—as a point of resistance against which the surgeon may work, and as a protection to the underlying structures.

Two very important surgical points demand attention even in the simplest operations for the removal of foreign bodies from the cornea,—namely, the proper sterilization of the spud and the disinfection of the conjunctival sac after the body has been removed. It is sometimes astonishing what an amount of injury an eye will withstand, and, again, what disastrous consequences may follow the neglect of proper antiseptic precautions after the most trivial injuries. Case after case is upon record in which, either because the foreign body itself contained infectious material, or because the spud which removed it was non-sterile, a violent ulcerated keratitis has resulted, causing abscess of the cornea, which terminated in a dense scar, and materially impaired or even obliterated vision. It is so easy to sterilize a spud that it is a precaution that should never be neglected. It may be done in the ordinary way by placing it in antiseptic fluid, or dipping it in boiling water, or, if the instrument is made of platinum, by bringing it to a red-heat in the flame of a spirit-lamp. After the body is removed, the conjunctival cul-de-sac should be thoroughly cleansed with one of the recognized antiseptic fluids. There can be no harm in taking these precautions, while great harm may result from failing to attend to them.

Dr. Jackson's paper closes with the report of a case, in which he was singularly successful in removing powder grains from the cornea with the electro-cautery. As is well known, when the attempt is made to extract bodies of this character by the ordinary methods, it is found that they are so closely associated with the surrounding tissues, that it is well-nigh impossible to dislodge them without causing extensive laceration of the

corneal structure. In Jackson's case three powder grains were found in the left cornea, deeply embedded and diffused. He touched each one with a pointed electrode, and thus destroyed them with the least possible damage to the surrounding tissues. The patient was exhibited, and the result left nothing to be desired. This novel suggestion is a distinct advance in our knowledge of the removal of an exceedingly troublesome and dangerous type of foreign body, and is deserving of imitation. As Jackson has pointed out, the same method is applicable to powder grains which are embedded in the skin, and in his patient very good results were obtained by applying the electrode to those granules which had found a lodgement in the skin of the lids, brow, and cheek.

THE TREATMENT OF INTESTINAL FERMENTATION AND INDIGESTION.

THE subject of this article is so large that it is almost impossible to do it justice in the brief space which we can devote to it. In a very large number of patients who come to a physician's office complaining of minor ailments they will be found to have as part of their disorder some failure of the most important part of the alimentary canal,—the duodenum. While we are accustomed, on the one hand, to consider the function of the saliva in the digestion of food as being almost so unimportant as to be worthy of little attention, on the other hand we are inclined to regard the stomach as being the most important part of the digestive portion of the alimentary canal. In reality the mouth and stomach may be considered as outer kitchens, in which the food goes through the course of preparation ere it enters the inner kitchen or duodenum, where the finer processes of digestion are carried out and where absorption occurs.

Careful recollection of the fact that the duodenum is the area of universal digestion, whereas the stomach can only digest proteid substances, impresses upon us the fact that the regulation of the diet must be, as we all know, a large portion of the treatment directed to the class of cases of which we speak.

It will generally be found in these cases that gastric digestion is sufficiently active to change the proteid materials into peptones which can be readily absorbed, and in many instances the regulation of the diet in such a manner that it consists chiefly of nitrogenous foods will do much towards remedying the difficulty under which the patient suffers. Frequently it will be found that limiting the starches to the smallest possible amount will give the patient great relief. Not only is this true of cases of intestinal indigestion and fermentation occurring in those who are otherwise in good health, but it is peculiarly the case with patients who, during convalescence from sthenic or asthenic diseases, find themselves in the difficult position of needing starches and other carbohydrates in order that their nutrition may be properly carried out, and yet find themselves with intestinal indigestion so impaired that the attempt to take starches results disastrously.

It is not our intention in this editorial to go over the hackneyed advices which have been given in regard to the use of acids, alkalies, vegetable bitters, and the thousand and one drugs which have been found in individual cases to be useful under circumstances similar to those of which we speak. We all know that in the presence of certain forms of gastric indigestion pepsin and hydrochloric acid, or pepsin and mild alkalies, give relief; that in many cases the use of derivatives of the pancreas do much good; that salol, and similar valuable antiseptics, frequently give great relief; or we may see recovery slowly occur from a carefully-regulated diet. The use of pepsin and hydrochloric acid for the purpose of improving the gastric digestion may indirectly remove the condition of intestinal disorder by making the process in the outer kitchen—the stomach—more perfect, and thereby requiring less work of the inner kitchen or duodenum. This, however, is but an indirect effect.

In regard to the use of the intestinal digestants derived from the pancreas, it is to be remembered that there is grave doubt whether these ferments ever reach the duodenum intact. Frequently they must be destroyed in the acid gastric secretions; and it is by no means certain that in all cases they exercise their influence in the stomach before sufficient gastric juice has been secreted to interfere with their activity. Then it is to be remembered that this is a reversal of the natural order of digestion, and it is doubtful whether in all cases it is wise to carry on in the stomach those digestive processes which are normally carried out in the duodenum. We know so little of the effect of the gastric juice upon the peptones which are formed by the action of ferments in the presence of an al-

kali that this method of medication must be largely empirical and hap-hazard. When salol and its relatives are used in these cases and act as intestinal antiseptics, they simply prevent food which has not been digested from undergoing fermentation. They do not aid in the preparation of food nor in its absorption. They are not cures; they are mere preventives.

The remedy which the physician wishes to use under such circumstances is entirely outside the range of substances so far discussed. We are all of us familiar with the words diastase and diastatic, terms which are necessarily exceedingly indefinite, and which are very much abused, especially by those who attempt for business purposes to impress upon the profession that their preparations contain diastase or the diastatic property to a great degree. We do not know what diastase is, save that it is a ferment, or ferments, which are capable of changing starch into sugar. We have the diastatic action in the saliva and in the pancreatic juice, and it would seem that the cases of which we are writing depend upon a failure of this diastatic property rather than failure of the other ferments of digestive organs.

For many years the diastatic properties of many of the malt preparations were so low, or developed only under the most favorable conditions, that little reliance could be placed upon such so-called food products, and it has only been recently that sufficient progress has been made to enable the manufacturer to place before the profession preparations which possess this power in sufficient degree to be given solely for their diastase and not with the idea of administering simultaneously a food or nutriment in the shape of one of the disagreeable derivatives of malt. There is at least one preparation of diastase which does not profess to be a direct aliment in itself, in other words it is a preparation which can be administered for the digestion of starches in exactly the same way that we have been accustomed for years to administer pepsin for the digestion of the proteids. Given during or immediately after meals, in so small a dose as a teaspoonful to an adult, we have seen marked improvement take place in the nutrition of patients, so that where strength seemed to be slowly returning because of inadequate quantity of flesh this difficulty soon passed away. How this curious substance, which is so indefinite, exercises its influence is not distinctly understood, but it seems capable not only of digesting and causing the rapid assimilation of carbohydrates, but also of very markedly increasing the appetite, so that food which has previously been loathed is now accepted and taken with hearty relish. We are, therefore, now possessed not only of pepsin and pancreatic derivatives for the digestion of proteids, but with the vegetable derivative diastase, which will aid us in the digestion of that important group of foods known as the starches. The physician who wishes to be sure of a diastatic product can readily obtain from his text-books on physiology descriptions of methods which will enable him easily to determine whether the product which is offered him is active in reduction of starch, and having once found the preparation which gives him the best results he can prescribe it with confidence in that very large class of cases which we have mentioned, with the additional advantage of being sure that it will exercise no direct effect outside of the alimentary canal.

THE MODERN TREATMENT OF WOUNDS.

FROM the time when Listerism was generally introduced, with all its troublesome technique, its powerful germicides, its cumbersome apparatus, its elaborately-prepared dressings, there has been a steady tendency to simplify methods and to do away with drugs which occasionally produced systemic poisoning; to substitute perfect cleanliness for antisepsis, to prevent the entrance of pathogenic microbes into wounds. Together with simpler methods have come more satisfactory results. Death from mercuric and carbolic poisoning, or even from iodoform absorption, is rare,—not only in medical literature, but also in actual practice. The credit of simplifying methods and of obtaining better results is undoubtedly due in great measure to the teachings of abdominal surgeons, and it is safe to predict that certain of their practices, authorized by their published results, will generally obtain in the performance of ordinary surgical operations.

It is well recognized that pathogenic microbes rarely enter a wound through the medium of the air. The word rarely is here used advisedly. Infection by such means is without question possible; that it has taken place repeatedly is highly probable. The chances of its occurring in a given case, however, are so slight that especial provision against this form of infection need not be taken *unless* the operation is of such a nature, or is performed in such a region, that the slightest infection is

liable to result seriously. For instance, in operations upon brain tissue, or in those involving exposure of a knee-joint, or in operations upon diabetics, not only should every precaution be taken against probable sources of contagion, but every possible source should be excluded; hence the chance of air contagion should be duly considered, and should be provided against by removing from the operation-room all dust-holding fabrics, such as carpets and curtains; by wiping walls, furniture, and floor with damp bichloride towels immediately before operating; by excluding those whose garments are liable to be septic, and by keeping doors or windows closed from the beginning to the end of operation. In hospitals this end should be attained by reserving an operating-room exclusively for this class of cases.

The use of powerful germicides upon wound surfaces is happily becoming less popular, as the full action of drugs of this character is generally recognized. It is now well proven that a wound surface which has not been unduly irritated is able not only to provide promptly for definite healing without undue serous exudation, but is also able by the antiseptic action of its living cells to destroy, or at least render innocuous, the few germs which are liable to gain entrance in the course of an operation, conducted according to modern methods. It is also shown that while strong antiseptic lotions, bichloride 1 to 2000 for instance, may destroy the germs which gain access to the wound, such lotions lessen or destroy the resistance of living cells, occasion profuse serous discharge, and distinctly delay healing. Hence the tendency of today is to use after the first incision weak bichloride solutions, or simply sterile lotions, such as boiled water, or boiled normal salt solution. Moreover, since profuse irrigation of wounds encourages a freer exudation than is required for prompt healing, these lotions are used as a medium for cleaning sponges or tampons rather than as direct washes for wounds.

With the advent of Listerism began the reign of catgut as an absorbable ligature material. Of late years this material has fallen under suspicion. It is shown that the commercial preparation of this ligature material exposes it to the danger of infection, that the ordinary methods of sterilizing it do not always succeed in destroying the germs lying in the central portions of the thickest strands of gut, that it becomes liquefied in the substance of a wound and there offers an almost perfect culture material for any germs which have gained entrance by chance infection or have been carried in by the gut.

Silk then became popular with some surgeons. It possesses the advantages of being stronger than gut of corresponding thickness, of being readily and thoroughly sterilized, of tying down more easily and more tightly. Its disadvantage lies in the fact that it is absorbed slowly or not at all, remaining as a foreign body. Hence, if there is any infection, sinuses running down to silk ligatures may remain for months or years, until the ligature is removed or discharged spontaneously. The objections to silk are sufficient to prevent it from coming into general use. In answer to the objections of catgut, it may be stated that trouble with this material generally comes from faulty preparation. Gut of medium thickness which has been rolled in loose coils and stored for weeks or months in oil of juniper, which is then stored for months in absolute alcohol, and which is finally kept for one or two days in a bichloride of mercury absolute alcohol solution 1 to 1000, may be considered thoroughly reliable. A long soaking in mercurial alcohol solution makes it so weak that it is practically useless.

However, since either gut or silk is a foreign body in a wound, and hence objectionable, the tendency of the day is to dispense with all ligatures as far as possible. It is found that the pressure of the hæmostats is sufficient to control most vessels; if not, a few twists will definitely stop bleeding. Hence breasts are excised, extensive tumor operations are performed, even excisions of joints are completed, often without the placing of a single ligature. Murdock reports hundreds of cases of major amputations without a single consecutive bleeding, torsion being exclusively relied on to check hemorrhage. Since crushed and devitalized tissues are practically foreign bodies in wounds, the proper use of the hæmostats is exceedingly important. The catching of a mass of tissue in the region of a bleeding vessel is to be avoided not only because it needlessly destroys tissue but also because it prevents the proper action of the instrument by interposing a soft pad between the blade of the forceps and the vessel, the walls of which unyielding pressure is designed to crush. Where possible, the vessel should be seized alone, or, where this is not practicable, as little surrounding tissue as possible should be taken up.

The necessity of providing for drainage is no longer as urgent as was the case a few years since. In all clean-cut wounds, such, for instance, as those made in ligating an artery

in its continuity, or in stretching or resecting a nerve, or in enucleating an encapsulated tumor, drainage is generally dispensed with. Even after such operations as excisions of joints, resection of bones, fixation of ununited fractures, and amputations, provided there has been no previous infection with the ordinary pus microbes, some surgeons close without drainage. In case general and local symptoms subsequently denote suppuration in the depths of the wound, exit for pus is readily provided for by breaking up the slight union at one or more places by means of hæmostats or dressing-forceps and inserting a tube.

The objection to the drainage-tube lies in the fact that it is a foreign body; that it provides a free communication from the surface to the deepest part of the wound, hence favors secondary infection; that it leaves a more or less permanent sinus, the walls of which are prone to become infected from the skin which cannot be permanently and thoroughly sterilized; that when it is inserted an extra dressing, hence additional disturbance, is required for its removal. In spite of these objections drainage either by tubes or by iodoform gauze, or other means, is absolutely necessary in certain cases, particularly when the operation field has been already infected as in joint-disease accompanied by sinuses; or when after operation a suppurating cavity is left which cannot be obliterated by pressure, as in empyema; or when the operation has been extensive and prolonged and the tissues have been subject to much rough handling, or to strong antiseptic irrigations. The general tendency of the day is, however, towards dispensing with drainage whenever this is possible.

The closure of the wound has recently received more attention than was formerly given to it. Since during the insertion of stitches there is, in addition to a certain amount of oozing from the whole wound surface, some bleeding from the needle punctures, and since even a small amount of blood delays prompt healing, some provision must be made to prevent even this moderate hemorrhage into the wound. This may be accomplished by an assistant making firm pressure over the entire wound surface while sutures are being placed, or better still by tightly packing the wound with sterile gauze strips the ends of which are brought out at one end of the incision.

When the wound is nearly closed these strips are withdrawn, firm pressure is made over the entire operative area, the last stitch is tied down, and a firm dressing is applied. Accurate coaptation of the skin surfaces is a matter of very great importance. Eversion means a granulating surface which slowly cicatrizes, inversion absolutely prevents union; accurate coaptation without drainage will in a few hours be followed by adhesions which will prevent infection, even should the skin surface be bathed in septic material. In applying the sutures it is important to avoid bruising or devitalizing the skin by tightly grasping its borders in dissecting forceps; such a procedure often prevents prompt healing. It is best to pick up skin edges with the fingers, or when this is not possible, the grasp of the forceps should be no tighter than is absolutely necessary. The popular suture material for general work is probably silk-worm-gut. This is strong, smooth, easily sterilized by bichloride, 1 to 2000, or boiling, and, unless very great tension is exerted, will retain its position with the first double turn of a surgeon's knot. It is somewhat too rigid for sutures which are purely superficial and designed only for skin coaptation; here fine Chinese twist, or, in some cases, horse-hair, will give better results. Either of these substances may be sterilized by boiling. The dressings employed show the same tendency towards simplification as the other methods employed. Most surgeons still prefer to place over the line of incision a smooth surface, such as gutta-percha tissue, or waxed paper, or, best of all, Lister's protective; this does not interfere with discharge, and prevents the gauze from sticking to the sutures and to the incision and occasioning pain and local irritation when it is removed. This smooth surface may be sterilized by dipping first in bichloride 1 to 2000, then by rinsing in carbolic acid 1 to 40, or in sterile water, or in salt solution. Over this is placed the gauze; what is chiefly required of this is that it should be absorbent. Many surgeons prefer that it should contain no antiseptics, sterilizing it shortly before or during an operation by boiling or by steam heat; others, and perhaps the majority, first sterilize it, then wring it out of bichloride solution, varying in strength from 1 to 3000 to 1 to 10,000. The stronger solution is sometimes followed by severe dermatitis. The number of layers of gauze required varies in accordance with the amount of wound discharge expected. After a simple incision, eight or ten would be sufficient; after prolonged or extensive operations, twenty or thirty may be required. Over the gauze comes a thick layer of absorbent or bichloride cotton, and, finally, a neatly-fitting bandage is applied. Such a dressing is often left on from four to thirty days. In ordinary cases the stitches are

removed in six or seven days, and the wound is found entirely healed.

The sterilization of instruments is accomplished by boiling in a one per cent. bicarbonate of soda solution—roughly, a heaping teaspoonful to the pint of water—for twenty minutes; they may be taken directly from the solution for operation. The addition of the soda prevents the instruments from rusting and slightly raises the boiling-point of the water.

Sterilization of the hands is best accomplished by cleaning of the nails and thorough and repeated washings and scrubbings in hot soapsuds, frequently changed. The washings should last for from six to ten minutes. Afterwards the hands may be washed in alcohol, then in bichloride 1 to 1000, though the soap and water seem to be the most efficient cleansers.

From the foregoing it will be seen that the practitioner can feel fairly certain of securing good results with means which he constantly has at his hand. The importance of chemical antiseptics has become less; the necessity for rigid cleanliness and the value of heat as a germicide have become greater. He can prepare all the needed materials necessary for conducting an aseptic operation and securing primary healing of the wound at slight expense to himself, and, provided there are some clean vessels and an abundant supply of boiled water, he can look forward to antiseptic results even when surroundings are most unfavorable.

Reports on Therapeutic Progress.

THE INTERNAL USE OF LYSOL.

Dr. Eric Vondergoltz, of New York, has considered his experience of lysol so favorable in the treatment of dysentery and cholera nostras that he has contributed a paper upon the subject to the *Medical Record* for September 24, 1892. He used lysol in doses of 3 to 10 grammes, in the strength of one per cent., as clysters. The astonishing results obtained by this means lead him to ask the profession to combat cholera and its relatives by this method.

The administration of lysol was always combined with that of a stimulant.

As stated in the *American Journal of Obstetrics*, vol. xxv., No. 2, 1892, the author has been engaged with the investigation of the antiseptic properties of lysol since October, 1890. By the different experimenters and himself it was found that, relatively, lysol is a harmless drug in comparison to the other powerful antiseptics. He gave the remedy in cases of infectious disease,—first in scarlet fever.

The following are the histories of the three most interesting cases:

May 11, Dr. Vondergoltz was called to the family of G. The three children were seized with scarlet fever, presenting nearly the same symptoms. The most alarming symptom was the high temperature, in cases 103.5° F.; the children also had all the other symptoms relating to the throat, lungs, tongue, eyes, and nose.

The urine of the two elder children showed much albumin and traces of sugar.

The conditions, especially of the eldest child (girl of seven years) and of the babe (fourteen months old), were very critical. The second child, a girl, five years of age, did not seem to be as ill as the others.

The internal antiseptic action of lysol was fully up to the writer's expectations. He gave it with sherry wine in the proportion of lysol 5 to sherry 10. Of this ten, five, and three drops, for the three children respectively was given in milk four times a day.

The effects of these small doses of lysol could be seen within the first twenty-four hours. The children were visited twice a day until May 16, which enables the writer to give a complete temperature record.

Analyzing first the curve of M. G., seven years of age; this child got forty drops the first day, with an increasing dose of five drops daily. The temperature fell steadily, without any recurrent exacerbation, till the morning of May 15, after which no change could be seen.

During the whole time the urine was examined with a double object,—viz., to see the effect on the albumin, and to note whether phenol could be found. No trace of albumin after the first twenty-four hours could be discovered. The urine showed only once the presence of sugar, the reason of which phenomenon could not be made out. All the other times the analysis was negative in every respect.

The decrease in the temperature-curve can be seen more clearly in the cases of the two other children. The explanation of this fact will probably be that the doses of five and three drops were, in comparison to the age, larger than ten drops were to the older child.

On the second day the temperature of the five-year-old child rose from 98° F. to 99° F. at 6 P.M., which was the result of the neglect of the mother to give the lysol.

On the fourth day the temperature of the baby rose from 98.5° F. to 100.5° F., but this

was explained by the fact that the mother gave her some beer.

These two incidents teach two things,—1, that the use of lysol must never be abandoned until the temperature has been normal for a few days; 2, that the diet has to be as restricted as possible, so that no irritation to the uropoetic system may result.

The mixture of lysol, one part, and sherry wine, two parts, could be taken very well in warm milk.

On the basis of his observations, Dr. Vondergoltz proposes as a formula for treatment of cholera Asiatica, 1, to give immediately a stimulant mixed with lysol, 2.5 grammes; 2, to wash out the intestines thoroughly with a one per cent. solution of lysol in warm water. This should be repeated every two hours until a change is seen.

OINTMENT FOR CHRONIC GONORRHŒA.

L'Union Médicale for June 11, 1892, gives the following prescription for this condition:

℞ Nitrate of silver crystals, gr. viii;
Lanolin (anhydrous), ʒviii;
Pure olive oil, ℥ss. M.

Sig.—Dissolve the nitrate of silver in a very small quantity of water, and incorporate it with the grease. This is then introduced into the canal by means of smearing it upon a sound.

This treatment may be resorted to from twice to three times a week, the sound being carried down to the point where inflammation exists.

ANTISEPTIC PAPER.

℞ Bichloride of mercury, ʒiiss;
Pure glycerin, ʒvi;
Distilled water (which has been boiled and cooled), Oi. M.

Make a thorough solution, and impregnate sheets of unsized paper, which are then to be allowed to dry. This paper may be applied over wounds, and fixed in position with a bandage.

A TONIC PRESCRIPTION.

L'Union Médicale for June 23, 1892, gives the following as a tonic prescription:

℞ Extract of cinchona, gr. xxx;
Tincture of nux vomica, gtt. xxx;
Bordeaux wine and syrup of bitter orange-peel, ℥i. M.

Sig.—Of this mixture from 1 to 2 teaspoonfuls may be taken each day, particularly after prolonged and exhausting illnesses.

AN OINTMENT FOR ECZEMA OF INFANTS.

SAALFELD recommends the following ointment:

℞ Boric acid, gr. xx;
Powdered oxide of zinc, gr. lxxv;
Powdered starch, ℥i;
Vaseline, ℥i. M.

Sig.—Make into an ointment and apply to the face of the child, first removing any crusts by the aid of olive oil.

It may also be advisable to administer at the same time cod-liver oil internally.—*L'Union Médicale*, June 23, 1892.

INJECTION FOR CATARRH OF THE BLADDER.

MOSETIG uses the following prescription in catarrh of the bladder:

℞ Iodoform, ʒiss;
Glycerin, ʒx;
Boiled distilled water, ʒiiss;
Gum tragacanth, gr. iv.

Wash the bladder out with warm water which has been boiled, and afterwards inject for three days a tablespoonful of the mixture named in a pint of hot water. It is stated that three or four injections are ordinarily sufficient to cure chronic cases of cystitis.—*L'Union Médicale*, May 5, 1892.

A LINIMENT FOR ACUTE INFANTILE PALSY.

L'Union Médicale states that the following prescription is a favorite with DESCROIZILLES in treating cases of acute infantile palsy:

℞ Essence of rosemary,
Essence of lavender, of each ʒv;
Essence of lemon juice, ʒiiss;
Alcohol, ℥viii. M.

Sig.—Apply with friction to the paralyzed parts.

THE TREATMENT OF CHOLERA.

In the London *Lancet* for September 17 are the following directions communicated by Sir Andrew Clark and Mr. Allchin to the Local Government Board in response to a letter from that body requesting information concerning the measures recommended by the Royal College of Physicians for the treatment of cholera Asiatica. After giving a number of rules, which are prophylactic in character, the following directions as to treatment are given:

If, notwithstanding this careful regulation of the manner of living, looseness of the bowels should set in, send immediately for medical assistance, since without personal examination and direction no case of this kind, arising in such circumstances, can be satisfactorily or even safely managed. But if medical assistance is not immediately available, follow the subjoined instructions until the doctor arrives.

Choose, if practicable, a bright, airy room, go at once to bed, keep quite warm, and if troubled with cramps or pains apply hot applications to the entire stomach.

Take freshly-prepared fluid or semifluid food in quantities of a large cupful at a time regularly every three hours. Such food may consist of boiled milk thickened with rice flour, baked flour, or biscuit powder; of tea made with boiling milk infused about five minutes, and having toast, biscuits, or rusks soaked in it; of farinaceous puddings of the nursery sort; of any kind of gruel, except that made with coarse oatmeal; of meat-jelly, of beef-tea, or of mutton, chicken, or veal broth.

If pain persists, with depression or faintness, take a teaspoonful of brandy or of whiskey in a small claret glassful of hot water after meals, twice, thrice, or four times in the course of the twenty-four hours, but not oftener than is absolutely required for relief.

If thirst becomes excessive, sip from time to time small quantities of iced water just sensibly acidulated with fresh juice of lemons or with aromatic sulphuric acid.

As soon as possible, after looseness of the bowels has begun, take in capsules or in hot milk, or in any other manner preferred, two teaspoonfuls of castor oil. If, when the action of the oil may be fairly supposed to have ceased, the looseness increases to a watery diarrhœa, let the hips be well raised, and carefully inject into the bowels a quart or more of hot water containing two drachms of benzoate of sodium or thirty grains of tannin. Furthermore, if there be much pain in the bowels, fifteen to thirty drops of laudanum may be added to the injection. The injection should be retained as long as it is comfortable to the patient, and it may be repeated once or twice daily during the continuance of the diarrhœa and until medical assistance has been procured.

After the administration of the injection, if one has been found necessary, the following mixture should be taken at intervals of from three to four hours, according to the urgency of the symptoms:

Mist. cretæ aromat., ℥i;
Tinct. camph. comp., ℥ss;
Tinct. chloroformi comp., gtt. xx;
Sp. ammon. arom., gtt. xx;
Cerii et bismuth. salicyl., grs. v
Ess. menthæ pip., gtt. x.
Take in one dose.

Should this mixture disagree, or in twenty-four hours fail to give relief, the mixture following should be substituted, and taken every three or four hours:

Acid sulph. arom. gtt., xv;
Tinct. camph. comp., ℥ss;
Tinct. chloroformi comp., gtt. xx;
Tinct. coto., gtt. xx;
Syrupi aurant. flor., ℥i;
Aq. menthæ pip., ad ℥i;
Take in one dose.

From the first appearance of looseness of the bowels, the body should be washed with warm water night and morning and quickly dried; soiled bed- or other clothing should be immediately disinfected and destroyed.

A cheap and efficient disinfecting fluid is recommended by Dr. Thorne, and is thus prepared: Dissolve half an ounce of corrosive sublimate and five grains of commercial aniline blue in three gallons of water, and add thereto one fluidounce of hydrochloric acid. Preserve in earthenware jars or wooden tubs.

THE TREATMENT OF SUMMER COMPLAINT.

In the *New York Medical Journal* for September 18, 1892, ILLOWAY contributes a long article upon this disease, and summarizes his ideas of treatment as follows:

The therapeutic indications are very plain. They may be summed up as follows:

1. Obviation of the etiological factor,—heat.

2. Cure of the dyspepsia.

Of course, where removal to the farm, to the mountain, to the sea-shore, is possible, it is the best measure that can be advised, as it fulfils in itself both therapeutic indications. Where, however, this is impossible,—and it is so in the majority of cases,—the best way of fulfilling indications is the wet-pack, as described.

The advantages of the wet-pack are many. It rapidly accomplishes a removal of the heat effects. It invigorates the system. It promotes the cure of the dyspepsia by favoring the secretion of HCl. It is easily applied, and even the dullest mother readily learns its mode of application and the indications therefor. Its use can be kept up through the whole

hot season, if necessary; two or three or more applications in the morning, two or three in the afternoon, and, if the indication therefor manifests itself, a repetition at night. There is no danger connected with its use; not the least harm can be done.

The author has never found a mother who did not at once consent to its application, and who, seeing its beneficial effects, did not carry out faithfully and intelligently the instructions for its use, which were simply to apply the wet-pack whenever the child's skin, especially that of the head, felt overwarm to the touch,—a condition usually indicated by marked fretfulness and irritability.

In cases of infants entirely or partially breast-fed, besides the measures above described, Dr. Illoway directs certain hygienic regulations for the mother,—viz.:

1. She shall sponge herself (at least the whole upper half of the body, from the root of the neck to the last rib) with cool water (the ordinary hydrant-water suffices) twice daily,—on rising in the morning and before she nurses the infant, and at night before retiring.

2. That she shall not nurse the child at any time throughout the day when overheated from cooking, washing, etc. She shall wait until she has cooled off and rested herself.

It is a well-established and well-known fact, set forth in numerous treatises, that morbid states affecting the mother have a decided influence upon the milk, and thence upon the child. The importance of these regulations for the welfare of the little patients and their rationale will be, therefore, readily understood without further elucidation.

If the dyspepsia has not been completely relieved by the wet-pack, we can aid nature to a rapid cure by (*a*) medication and (*b*) regulation of diet.

As regards medication, there is only one remedy indicated, and that is hydrochloric acid. The value of the acid in all cases where the natural secretion is deficient therein (malignant disease excepted) is fully established. Its usefulness in the malady under consideration was already long ago attested by Jacobi. Lesage advises an acid as the remedy *par excellence* for green diarrhœa.

It is remarkable to observe how quickly the dyspepsia and its symptoms disappear under the use of the acid. The green or white stools give place to stools of normal color and consistence, all offensiveness disappears, the development of flatus is inhibited, the appetite becomes good, and the child regains its bright and cheerful look.

The acid may be administered combined with milk, according to Rudisch's formula, or it may be given in doses of 2 drops in a teaspoonful of water every two to three hours at first; later on, as the dyspepsia improves, at longer intervals, three to four times daily. Illoway has found this method very effective in many cases of infantile dyspepsia due to deficient secretion of HCl. This latter method is usually to be preferred, but where the child is very much enfeebled, either from neglect or improper treatment, it is best to employ Rudisch's method for the first few days, and as soon as the child gains strength give the acid in the ordinary way.

Dr. Illoway employs the acidum hydrochloricum dilutum of the U. S. P.

In exceptionally severe cases that have lasted some time—two weeks and over—before coming under treatment, the administration of 2 to 3 grains of the bismuth subnitrate (in powder) every two or three hours (for one or two days) proved an excellent adjuvant to the treatment above described.

For the flatulence and the pain caused thereby the rectal injection of a small quantity of a strong decoction of peppermint, or the administration of lac assafœtidæ, in ½-drachm doses, gives excellent results. The regulation of the diet is of the greatest importance in the treatment of dyspepsia. The quantity of food (cow's milk from a reliable dairy, boiled, and kept in a closed vessel is advised, although occasionally the author has found some artificial foods and condensed milk well borne) for each feeding should be somewhat less than the normal quantity.

The number of feedings must not be beyond the accepted standard; better less, but never more. The child must not take a bottle to bed with it (a very common practice among poor people). As it need not be fed more than twice in the night, a fresh bottle should be prepared for it about 11 P.M. and 3 A.M. When milk is badly tolerated in any form, nothing is better than the decoction of barley, prepared according to Jacobi's directions. With all this there must be enjoined upon the mother an observance of the most scrupulous cleanliness of all clothing of the child, of its bedding, and of all its feeding-utensils. It is almost superfluous to say here that an abundance of fresh air is insisted upon; the child to be taken out of doors in the early morning hours and later in the evening, if possible, to a park. This is of special importance to those living in rather cramped and close apartments, that are generally more like bake-ovens.

Of the many measures otherwise proposed for the treatment of this disease, but two require any consideration here,—lavage of the stomach and intestinal irrigation.

To lavage there are many serious objections. It requires the skilled hand of a physician for its application. This alone would be an insuperable obstacle to its general use. The poor cannot pay a physician for frequently-repeated and long-continued visits, and but very few physicians will burden themselves with such a task where there is no prospect of remuneration.

It is true that it has been maintained that one, or at most two, applications suffice for the cure. Experience, however, has not sustained this allegation. A moment's consideration will show that it cannot be so. The etiological factor being constantly active, the pathological condition that necessitated the lavage is reproduced, and such reproduction certainly makes requisite a repetition of the remedial measures.

It is not by any means so harmless and simple a measure as we have been led to believe. In an article on the "Treatment of Diarrhœa in Early Life," Dr. H. C. Chapin reports the occurrence of fatal syncope from introduction of the tube and distention of the stomach with water. But lately a case was reported in which longitudinal rupture of the mucous coat near the pyloric extremity and death resulted from lavage of the stomach.

It does not fulfil the therapeutic indications in the measure requisite. This needs no further elucidation here, for it will be at once apparent to all that, if the views as to the etiology and pathology of summer complaint as set forth here be correct (and they undoubtedly are), lavage of the stomach is a very inadequate remedy,—too inadequate to be employed when simpler and much more effective measures are at our command.

As a matter of fact, despite the glowing accounts from Epstein's clinic and the high recommendations of Seibert, lavage of the stomach has found but little favor in the eyes of practitioners and is but rarely resorted to, undoubtedly for reasons as set forth above.

Dr. Illoway believes he is keeping within the bounds of truth when he says that no such process is at all resorted to as intestinal irrigation; the injection of a little cool water into the rectum is not intestinal irrigation,—not at all as understood by its author.

Rectal injections of cold water are not sufficiently effective in any way. The same objection, therefore, holds good here also. They do not fulfil the therapeutic indications in the measure requisite. Taking all things into consideration, it can be safely maintained that the plan of treatment as outlined and advocated here is far superior to any that has been devised. It answers thoroughly all the therapeutic indications furnished by a careful study of the etiology and pathology of the disease. It is simple, and once instructed as to its purposes, any person of ordinary intelligence can carry it out. It is economic, it is cheap, and therefore within reach of the poorest of the poor.

As will be seen, the writer makes no mention of the sterilization of milk, now regarded as one of the most important factors to recovery. He regards this as unnecessary, and claims to accomplish a restoration of the normal antiseptic qualities of the gastric juice. This he holds as a far superior method, as it affects not alone the destruction of bacteria introduced from without, but also the inhibition of the activity of the bacteria that normally inhabit the digestive tract.

And this superiority is still further enhanced by the knowledge afforded us by the valuable investigations of Leeds and Davis,—that the nutritive value of milk is destroyed by sterilization.

His directions as to milk used for infant-food are: That it shall be obtained from a reliable dairy; that it shall be gotten twice daily, morning and evening; that it shall be boiled as soon as received for half an hour in a vessel kept solely for that purpose; that it shall be kept covered, not allowing the cover to be off at any time longer than necessary to take therefrom the modicum of milk needed for each feeding; that it shall be kept in a cool place; if that is impossible, and it frequently is among the poor, it should be put in a large vessel containing cool water, to which a piece of ice is added from time to time.

THE USE OF SULPHONAL IN ARRESTING THE CRAMPS OF FRACTURED LIMBS AND OTHER REFLEX SPASMS.

Dr. Edward Andrews, of Chicago, contributes to the *Journal of the American Medical Association* for August 27, 1892, a brief article upon the use of sulphonal for the purpose of overcoming reflex spasm. After recognizing the fact that its action is very slow, and that when the cramps are nocturnal it is necessary to give a large dose two or three hours before bedtime, or else to give moderate doses several times a day, he strongly urges the employment of this remedy in such

spasmodic affections. He reports the case of a vigorous young man who fell forty-two feet, striking obliquely on a slope of timber, causing a severe contusion of the right sciatic nerve, without any fracture. The thigh and leg of the injured side were affected by a constant and painful jerking motion, resembling chorea. Two doses of sulphonal of 15 grains each completely arrested the distressing movements.

In the discussion which followed the reading of his paper a number of physicians recorded their experience, which, as a rule, was favorable.

THE TREATMENT OF DYSENTERY BY INJECTIONS OF A SOLUTION OF CARBOLIC ACID.

Dr. Kilduchevski first reported in 1889 the results of the treatment in a military hospital of forty cases of sanguinolent diarrhœa, without any deaths, by injections of carbolized water. Since then he has treated one hundred and twenty cases, with a mortality of twenty per cent.

Four years' further experience with the remedy has confirmed him in his favorable estimate of it. He employs 3½ grains of carbolic acid in a little less than two quarts of filtered boiled water. Two injections are given each day, and in grave cases as many as three are given. The administration of opium is completely abandoned, and by the use of the injections the bowels are thoroughly washed out of all irritating and poisonous materials. He has found out that these injections exercise a most favorable influence on the ulcers in the mucous membrane. Other substances than carbolic acid may be employed, such as boiled water alone or creolin in solution.

The diet is most severely regulated, and consists entirely of milk or bouillon, with a little white bread or some broiled eggs. Iced milk is best tolerated, and may be taken by patients who refuse all other food.—*Journal de Médecine de Paris*, August 14, 1892.

A CASE OF ACONITE-POISONING.

In the *Boston Medical and Surgical Journal* for August 25, 1892, Dr. Samuel Q. Robinson reports the case of a man in the United States army, recovering from a debauch, who, at about 4 P.M. on July 3, took, as nearly as could be ascertained, two drachms of tincture of aconite. Dr. Robinson was called to the patient an hour after the ingestion of the poison. At that time the symptoms consisted of great restlessness, with moments of unconsciousness; radial pulse imperceptible; carotid pulse 119; respirations 19 (normal in character, but afterwards becoming shallow); pupils slightly dilated, but responsive to light; nose pinched; extremities cold; face bedewed with cold sweat. The condition of the man was one of collapse. Between $\frac{1}{10}$ and $\frac{1}{8}$ grain of apomorphine was administered hypodermically; this produced vomiting; as swallowing could not be performed, the stomach was washed out with a stomach-pump. In the four hours succeeding the ingestion of the poison the patient was given twenty-five minims of tincture of digitalis, forty-five minims of aromatic spirits of ammonia, and two drachms of brandy hypodermically. Hot-water bottles to the feet and mustard-plasters to the præcordia were also used. The ammonia was used because the case was so pressing as to seem to warrant its use. Some induration followed the injections of the brandy, which were all deeply made in the muscular tissue. Ultimate recovery took place.

A PRESCRIPTION FOR PAINLESS DILATATION OF THE CERVIX UTERI.

Le Fort recommends the following prescription for this purpose:

℞ Iodoform, ʒiii;
Powdered cocaine, gr. lxxx;
Sulphuric ether, ℥iii.

Make a solution, and wet a laminaria tent with the same. This may then be introduced into the uterine canal, and dilatation obtained without causing pain.

—*L'Union Médicale*, August 13, 1892.

THE TREATMENT OF THE SUMMER DIARRHŒA OF INFANTS.

Dr. Frank W. Talley contributes an article to the August number of the *Annals of Gynæcology and Pædiatry* upon this subject, and, in the course of it, gives directions as to the methods to be employed in cleansing the intestinal canal by washing out the stomach or intestines with water either pure or medicated with boracic acid or thymol.

The apparatus needed for this manœuvre consists of a fountain syringe, over the nozzle of which is fitted a large-sized flexible rubber catheter. In using the apparatus the end of the catheter is placed on the back part of the

child's tongue, when a swallowing motion will be noticed, and the tube can without effort be passed into the stomach. Irrigation should be continued until the washings come back perfectly clear. This procedure is valueless unless irrigation of the intestines is conjoined. Here the same kind of apparatus is used. The child is laid stomach down on the nurse's lap, previously protected by a rubber apron, and the tube is passed into the anus while the stream is flowing. This facilitates its introduction. It is passed on as far as possible, beyond the sigmoid flexure in most cases, and water passed in until the bowel is distended, when the resistance of the sphincter will be overcome, and the contents, tube and all, will be forcibly expelled. This should be repeated until the canal is washed clean. The relief obtained by removing the fermenting contents of the bowel is marked, and very often the child falls into a peaceful sleep on the nurse's knee. Such washing should be repeated daily.

After thus cleansing the alimentary tract, as far as possible, of the colonies of bacteria and their toxic products, the next step is to administer antiseptic drugs, and the most efficient of these are calomel and salol. They are best given in small and frequently-repeated doses. 1 to 2 grains of calomel, or 1 to 4 grains of salol, daily, in fractional doses, are enough for a child 1 year old. Subnitrate of bismuth, in 5- to 10-grain doses, is an old and reliable remedy.

The second indication includes the support of the patient until the toxic matter is eliminated. The heart must be sustained, the temperature reduced, and the nervous symptoms allayed. Under copious irrigation these symptoms are greatly moderated.

If the vomiting and purging, nervous symptoms, restlessness, delirium, or convulsions continue, opium is indicated. Morphine hypodermically is the best form; $\frac{1}{100}$ grain of morphine, with $\frac{1}{800}$ grain of atropine, may be given to a child 1 year old, and repeated in one hour if necessary. For hyperpyrexia the cold bath is the only treatment. The child should be placed in a bath at 100° F., and the temperature of the water gradually lowered to about 85° F. by adding ice, and the patient allowed to remain until the proper amount of reduction is effected. These baths may be repeated hourly if the high temperature persists. Stimulation is necessary,—iced brandy or champagne, in small doses, frequently repeated, if tolerated; if not, the hypodermic administration should be resorted to. After the stomach has become tolerant and the diarrhœa is checked, the sterilized milk is to be given in small doses. A change of air to the sea-side or mountains is then indicated to secure a rapid convalescence.

THE TREATMENT OF EPILEPSY.

In the *Dietetic and Hygienic Gazette* for August, 1892, DR. FREDERICK PETERSON, of New York, contributes an article upon the treatment of epilepsy, which is supposed to be a summary of the best treatment as employed at the present time.

Surgical Treatment.—A limited number of epileptics may be treated surgically with benefit in the vast majority of cases, and with good hope of cure in a select few. The cases eligible for trephination are those that give good evidence of a cortical lesion, such as a palpable depression in the skull, with a history of an injury, or where the epilepsy is distinctly Jacksonian in character, thus indicating a certain point of cortical irritation where the epileptic explosion begins. Trephining, when done by a skilful surgeon and under strictest antiseptic precautions, may be looked upon as a comparatively safe operation. It should be resorted to more often than it is as a preventive measure, particularly in cases of head injury, which seem, on first examination, to be trivial, but which, in the course of time, develop epilepsy. A case in point presented himself at the Vanderbilt Clinic. A boy of 20 was struck on the head by a bottle falling from a third-story window. There was no loss of consciousness, and apparently no injury to the skull. At any rate the scalp wound, which was severe, was sewed up, and healed rapidly. This was three years ago. During the first year after the accident he had one epileptic fit; during the second year, two or three; now he has them two or three times weekly. There is a large scar and an apparent depression over the right fronto-parietal region, very near the median line. Such a case is a proper one for trephination, although there are no symptoms of focal epilepsy. At this point will be found either a depressed spicula of bone, a meningeal thickening, or a cortical sclerosis, requiring removal.

Dietetic Rules.—Eating and drinking should always be moderate. Alcohol, coffee, and tea should be eschewed, and smoking also in most cases forbidden. Undoubtedly the best food

for the epileptic is a vegetable and milk diet, but meat should not be altogether excluded. A vegetable diet does no harm to an adult, but should be combined with fats in the shape of oils, butter, or fat meat. We know very well that whole nations live almost exclusively upon such a diet, as observed by the author among the hard-working, muscular Egyptian fellaheen. But growing children require proportionately more food than adults. They have not only the daily waste to supply, but a growing organism to build up, and to form a large amount of proteid (Bunge); and a mixed, though light and easily-digested, diet should be ordered. The dinner should be in the middle of the day; the evening meal should be light. There is as yet no explanation of the nature of the epileptic explosion in the convulsive centres. Theoretically, they are looked upon as nutritional disturbances in nitrogenous compounds in nerve-cells. That we have to deal with profound chemical changes in the central nervous system in most cases there is no doubt. Recent studies in the urine of epileptics have demonstrated the truth of this, and after a time we shall by more careful study be able to modify by diet alone the frequency of seizures in many cases.

Employment.—It is too frequently the fact that the unfortunate epileptic is given a prescription, a few words upon diet, and then allowed to take his own course. But the employment of mind and body is of vital importance in most of these cases. An out-of-door life in the country is that best adapted for them. If the patients are so badly off that they cannot fulfil their usual social obligations, get an education in the schools, or carry on their trades or professions among their fellows, they must be sent to an institution for epileptics, where provision is made for all such needs. The best institution in the world of this kind is that at Bielefeld, Germany, according to the writer, although similar institutions are now being organized in this country. There is one already in embryo in Santa Clara, Cal., one nearly completed at Gallipolis, O., and New York will have located a site and secured plans for buildings on the colony system before the end of this year.

Hydrotherapy.—Cold shower-baths and cold sponge-baths daily are beneficial. The shower-baths should be rain-like in character,—that is, not too forcible.

In many cases a morning and evening bath (the "half-bath") proves very serviceable. The "half-bath" is taken in a bath-tub only half-filled with water, and when taken should be accompanied by energetic rubbing of the patient by an attendant. This bath lasts five minutes, and the temperature should not be under and not over 70° F.

Where there is evidence of hyperæmia and increased blood-pressure in the head, the cold cap is useful.

While these are the general indications for hydrotherapy, certain measures are often of use at the time of seizures. During a fit, or during a *status epilepticus*, it will be observed that there is one of two vascular conditions present: either the face is pale and there are signs of brain anæmia,—and in this case warm wet compresses should be applied to the head and genitals, accompanied by friction of the trunk upward, the body being placed with head low and arms uplifted,—or there is turgescence of vessels in the head, the face is red, the carotids beat strongly, and under such conditions a contrary procedure is indicated,—cold compresses to the head, neck, and genitals, strong wet-beating of the feet, with a high position of the head.

Treatment with Drugs.—For the great majority of cases of grand mal and petit mal a bromide will be found by far the most useful drug. Only one bromide should be used, and the experience of some of the best practitioners (like Gowers), and one of the greatest epileptic colonies for twenty-five years (Bielefeld), is that the bromide of potassium is the best salt having the least irritating effect upon the gastric mucosa. It is a pity that it cannot always be obtained in pure form, for, as ordinarily sold, it has impurities, like chlorate of potassium, to the extent of six per cent. It is to be hoped some chemist will undertake a careful comparative analysis of the various bromides in our market, as it is very important that a pure drug should be employed.

The bromide of potassium may be prescribed in powders of 10 to 15 grains each, to be taken with plenty of water after meals, or may be given in a solution in water simply, as follows:

℞ Potassii bromidi, 40 grammes;
Aquæ puræ, q.s. ad 200 grammes. M.

Which is a proportion of one-fifth of the drug to a teaspoonful, making a dose of 12 to 15 grains, according to the size of the teaspoon; or it may be given in a 1 to 4 solution.

℞ Potassii bromidi, 50 grammes;
Aquæ puræ, q.s. ad 200 grammes. M.

While in the ordinary diurnal forms, it is, perhaps, as well to give this quantity in three doses daily, it is, as a rule, better in the nocturnal form to prescribe either an extra dose at night, or the whole amount of 40 to 60 grains in one dose at bedtime, in a full glass of water.

While children will bear large doses of bromide fairly well, it is better in those from 10 to 16 years of age to begin with 10 grains three times daily, and in those under 10 years with still less.

Each week an additional dose should be added for three or four weeks, the object being to push the drug to the limit of physiological tolerance,—very nearly to the state known as bromism. But extreme discretion must be used in the early part of the treatment to discover the patient's susceptibility to the remedy, and to guard against its harmful effects.

Chloral may often be advantageously combined with the bromide (Seguin), particularly in cases with a tendency to severe cutaneous eruptions; when thus administered the bromide itself should be proportionately reduced.

Where indicated, other agents may be employed for concomitant conditions,—iron for anæmia, arsenic for the acne, and saline waters and saline salts for constipation.

To sum up in a brief sentence, the treatment for epilepsy of all forms in general must consist of careful regulation of the diet, hydrotherapeutic measures, out-of-door employment and the bromide of potassium.

Occasionally there are cases that do not do well on a bromide. To these may be given borax in 15- to 20-grain doses three times daily after eating, or lactate of zinc 7 to 12 grains at a dose. Tincture of simulo will at times be found useful in 1- to 2-drachm doses (Starr).

In petit mal excellent results have been obtained with nitro-glycerin in doses of $\frac{1}{100}$ grain three times daily.

In the nocturnal form, tincture of belladonna, 5 to 10 minims, or atropine $\frac{1}{150}$ grain alone, is at times strikingly effective.

For patients who feel their attacks coming on, it is the custom at the Vanderbilt Clinic to provide a wide-mouthed glass-stoppered bottle, containing nitrite of amyl in a plug of cotton. When an attack is impending, the patient smells of the vapor, and often in this way wards off a seizure or diminishes its severity.

Whenever a case is taken in charge, he should be provided with a blank form, upon which not only should the patient register his attacks as they occur, but the physician should write his regulations for baths and diet, and put down in cipher for his own use his treatment, the blank to be returned to the doctor in charge at the end of a year. Dr. Peterson has had made for his own use a special form of blank by G. P. Putnam's Sons, of New York, which he finds exceedingly serviceable. It is printed on heavy paper, so that it will not wear out when carried in the pocket for a year, has spaces for monthly notes of treatment, for a daily record of attacks, for monthly, half-yearly, and annual statements of the number of seizures, for orders as to baths, and, furthermore, the proper regulations as to diet and kinds of food are printed upon the back of the register. He will send a sample of this epileptic record to any one who desires it, or application may be made to the publishers.

A POWDER AND SOLUTION FOR ACUTE CORYZA.

L'Union Médicale for August 11, 1892, gives the following prescriptions for this condition:

℞ Subnitrate of bismuth,
Powdered benzoin, of each ʒiss;
Powdered boric acid, ʒi;
Menthol, gr. iii.

Mix and insufflate a small pinch of this mixture from five to six times a day in acute coryza.

Or the patient may have recourse to the following solution:

℞ Hydrochlorate of cocaine, gr. xv:
Distilled water, ʒii.

Twice a day introduce into the nasal fossa a small antiseptic tampon impregnated with this solution. This will not only relieve the stoppage of the nostril, but will also do away with the cephalalgia, which is such an annoying symptom.

CHOLAGOGUE CACHETS.

According to *L'Union Médicale* for August 9, 1892, DUJARDIN-BEAUMETZ employs the following cachets for the purpose of exercising a cholagogue and antiseptic influence in the intestine:

℞ Salol,
Salicylate of bismuth,
Bicarbonate of sodium, of each, ʒiii.

This is divided into thirty cachets, one of which is taken after breakfast and one after dinner, particularly by persons who suffer from biliary lithiasis.

AN ANTISEPTIC CATHARTIC.

L' Union Médicale for August 18, 1892, states that EICHLER employs the following prescription as a cathartic and intestinal antiseptic :

℞ Salol, ʒi;
Castor oil, ʒvi;
Syrup of rhubarb, ℥iss;
Cinnamon-water, ℥v;
Powdered gum-arabic, a sufficient quantity.

Make into an emulsion, and administer one tablespoonful every hour until a purgative effect is obtained in cases of chronic diarrhœa, or else one full dose may be employed, using at the same time a disinfectant rectal injection, containing fifteen grains of salicylic acid to a pint of distilled water. The diet should be composed principally of milk and beef-tea.

THE TREATMENT OF GASTRALGIA AND ATONIC DYSPEPSIA BY ELECTRICITY.

DR. A. D. ROCKWELL, of New York, contributes an article to the *Boston Medical and Surgical Journal* of August 18, 1892, upon this subject :

Much difference of opinion exists concerning the cause and character of the distressing symptoms that we term gastralgia. Neuralgia of the stomach is undoubtedly associated with, and is an expression of a variety of pathological conditions. The slight heaviness or fulness after taking food, characteristic of chronic gastritis, hardly amounts to a neuralgic pain ; but in atonic dyspepsia the pain is occasionally acute. Both ulceration and cancer of the stomach cause the severest pain, and are susceptible only of slight relief through electricity. Chronic catarrhal gastritis occurring in the gouty subject is another cause of gastralgia, for the relief of which dependence must be placed upon remedies other than electricity. Experience shows, however, that there does exist a form of gastralgia dependent neither upon inflammation nor organic disease, entirely functional in character, and relievable by very much the same methods as neuralgia in other parts of the body.

Electricity enables us not infrequently to diagnosticate between gastralgia dependent upon organic changes in the stomach, such as ulcer, beginning carcinoma, etc., and gastralgia of the purely neurotic type. A case in point is as follows: Some time ago a gentleman consulted the writer for a severe pain in the stomach, that had persisted for more than six months. The character of the pain was suspicious, and he had been told that the cause of it was ulceration. As in pain from that cause, so the pain in his case was referred to one spot in the epigastrium and in the back. When the stomach was empty, but little, if any, pain was experienced ; but, in a very few moments after eating, the distress was often extreme. The first application of electricity was made at the beginning of a severe paroxysm of pain, and within five minutes it disappeared completely. This result indicated very clearly that an ulcer was not present, for in a number of cases of this character which have fallen under the author's observation every one had failed to be relieved by any form of current or any method of application.

It is not to be expected that this aid to differential diagnosis never fails, for true gastric neuralgia may resist the action of the current, as do other neuralgic types. When, however, it does relieve as promptly as in the case just referred to, its diagnostic value is undoubted.

In treating gastralgia both forms of dynamic electricity have proved effectual, and in the selection of the current one must be governed by the special indications in each individual case. Not infrequently, indeed, it will be found impossible to determine which form of current is best adapted to the case in hand until actual trial is made. In a considerable experience, however, in the treatment of gastralgia, Dr. Rockwell has found that in those cases where firm pressure over the seat of pain tended to relieve rather than to increase the pain, the faradic current of high tension, or the rapidly interrupted static induction current yielded the best results. On the contrary, when the part was sensitive to pressure, pain being increased rather than relieved, the galvanic current generally proved most effective. In one case of gastralgia, in which the faradic current of high tension was indicated, but which failed to accomplish very much, the static interrupted current succeeded in affording speedy relief.

In using the galvanic current, electrodes of plastic sculptor's clay are preferred by the writer, placing the anode over the seat of pain. In this way currents of twenty to thirty milliampères, through a comparatively small electrode, are easily endured.

The integrity of one's digestive powers depends upon the tone of the muscular tissues

of the stomach, as well as upon the healthful action of the nerve-centres and connecting nerves. The vast majority of cases of confirmed indigestion, for which relief is sought, depend upon no structural change in the stomach, but are occasioned by a deficient secretion of gastric juice or a defect in the muscular tone of the organ. The resultant feebleness of the viscus lessens the activity of the characteristic churning movements that attend the digestive process, and the first act of digestion is unduly prolonged. Atonic dyspepsia is sometimes hereditary, and in such cases tends to manifest itself rather early in life; but, when no hereditary tendency exists, the disease is more often one of later years.

Like all other organs, the physiological activity of the stomach declines as years increase, and dyspepsia among the aged is a common symptom, while among the younger and well-to-do portion of the community who suffer from atonic dyspepsia the cause is usually to be found in an undue amount and frequency of food. Then, again, under the mistaken idea that conditions of debility must be corrected by the frequent and large ingestion of food, the stomach is never allowed a sufficient period of repose. The poor as well as the rich suffer from this form of ingestion.

Innutritious as well as insufficient foods are potent causes of atonic dyspepsia, the cure for which is in many cases simply a more generous diet. Anything, indeed, that interferes with the secretions of the stomach, or with its muscular action, tends to weaken the functions of digestion. Atonic dyspepsia is, therefore, often associated with any chronic discharge, such as leucorrhœa, and it is not uncommon to find anæmia and indigestion closely allied. Atonic dyspepsia is seldom attended with acute pain, although there are exceptions. As a rule, the disease develops very gradually, about the first symptom observed being more or less flatulence, associated with a feeling of distention after eating. The distended stomach may also interfere with the action of the diaphragm, and occasion more or less dyspnœa.

Eructations are common and annoying, but vomiting is seldom observed. The appetite in this disease may finally become greatly deficient, and sometimes there is an absolute aversion to food. Impaired digestion, long continued, is often associated with marked functional disturbance of the heart, that manifests itself most violently at night. The pulse is often slow and feeble, and the extremities cold.

Constipation is a pretty constant symptom, and loss of flesh and strength almost necessarily follow. Organic diseases are, as a rule, readily distinguished from this functional disturbance, but it becomes more difficult to differentiate between atonic dyspepsia and certain inflammatory affections of the mucous membrane. A diagnostic point of importance is the epigastric tenderness which is almost invariably associated with inflamed conditions of the gastric mucous membrane; while, in cases of indigestion due to atony, pressure causes no pain. Neither acidity, heartburn, or vomiting are common in atonic dyspepsia, as in gastritis. While in inflamed conditions of the stomach the urine is high-colored and loaded with lithates, in atonic conditions it is rather pale in color, and deposits oxalates or phosphates.

Although electricity is only one of many remedies that may be indicated in atony of the stomach, yet an abundant experience in the treatment of this condition justifies placing it in the front rank of our therapeutic resources. Manifestly the indication of primary importance is to remove, so far as possible, the causes of the disease. Whatever is injudicious in the quantity and quality of the food, or the frequency with which it is taken, should be corrected, and the patient instructed as to proper methods of living. If he continues to masticate his food imperfectly, eating too much or too little, or persists in indolence or luxurious methods of living, neither drugs nor electricity will avail. In connection with proper hygienic methods, electricity will help on rapidly to a greatly improved condition of health. Whether the defects of digestion depend upon an exhausted condition of the nervous system, interfering with the normal activity of the processes of excretion and secretion, or whether the blood-supply is deficient in quantity or abnormal in quality, the well-attested action of electricity in modifying the physiological functions of the body renders it the most efficient of remedies. The tendency of electricity is both to increase secretory processes and to modify their quality. The secretion of the gastric juice and of the intestinal fluid has been shown to be increased by external electrization alone.

Even without demonstration, analogy shows that these fluids ought to be secreted in greater abundance under the influence of the current, and the results of the treatment in pathological cases give this probability the force of

certainty. Appetite is sharpened, digestion is quickened, and constipation relieved both by local and general treatment, so rapidly and so decidedly as to make it evident that the gastric and intestinal fluids are made to secrete more liberally by the action of the current on the nerves that supply these organs than on the tissues of the organs themselves. An excellent means of studying the variations in the nutrition through electrization is found in the elimination of urine. This is believed to be a result of oxidation processes that may take place either in the kidney or in the tissues, or in both.

Animal nutrition is a process of enormous complications. There is no single chemical change at which one can point and declare that this explains the growth and sustenance of the body; but there are nameless and numberless phenomena every moment going on in the living tissue, and as a result of these, in their infinite play and combination, the body lives, moves, and has its being. Electricity, in passing through the body, modifies many or all of these processes, and thus modifies nutrition.

As a resultant of the complex, physical, chemical, and physiological action of electricity on the tissue, there is increased development and growth. The faradic current of rapid interruption and high tension yields results superior to the galvanic in the treatment of atonic dyspepsia. In the use of the faradic current, the treatment must be both general and local. General faradization is pre-eminently indicated in this affection, not only for its direct but for its reflex effect upon the nerve-supply of the stomach. While in dilatation of the stomach internal applications are of the greatest service and often indispensable, in atony they are seldom, if ever, indicated. In the use of the faradic current, the electrodes should be sufficiently large to prevent any undue concentration of current, and instead of being stationary, the pole over the region of the stomach should be kept in almost constant motion. In this way and by the exercise of care, it is quite easy to avoid those painful muscular contractions that so frequently occur.

Through inattention to this simple precaution, violent and prolonged spasm is liable to occur, exhausting the patient and discouraging him from further attempts in this direction. The continuous or unbroken action of the galvanic current, notwithstanding its usually good effects in the promotion of nutrition, when used in this way, seems to be of little use in atony of the stomach. The direct mechanical action, and the indirect reflex effects of a mild galvanic current rapidly interrupted, is undoubtedly of service, although inferior in its therapeutic effects to the induced current of high tension.

STRYCHNINE AND DIGITALIS IN DIARRHŒA.

In the London *Practitioner* for August, 1892, Surgeon-Captain Harold Hendley writes upon this subject:

Fever of a remittent character or with a tendency to a continued type has often necessitated recourse to various drugs and expedients to meet the many complications that arise. A complication occurring frequently, and at a time when the patient, worn out by fever and with rapidly failing digestive powers, is least able to resist it, is persistent diarrhœa.

In such a case the temperature at this stage probably ranges from one to two and a half degrees above normal; the pulse is soft and yielding, not very rapid, and markedly wanting in tone. The motions, at first four or five in the day, increase in number, until each instalment of nourishment appears to excite an action of the bowels, which has an ever greater tendency to fluidity. The extreme is reached when the motion escapes involuntarily, but is followed by a decided tendency to cardiac failure, if not collapse, which is not unseldom accompanied by a consciousness of approaching dissolution in the patient. It was in such a case as this, occurring in an English lady in India, that the author first tried the effects of a combination of tincture of digitalis and liquor strychninæ, the one on account of its well-known general action on the vaso-motor nervous system, and the other for its lesser-known, more direct action on that portion of this system concerned in the control of the blood-supply to the intestines. There was the risk that the strychnine might increase peristaltic action, but, having often given it for constipation, it appeared that its marked good effect in this complaint had been due to increased muscular tone, more especially in the lower bowel. Now, however, the need seemed greater than the risk, so astringents were stopped, and a mixture was given containing tincture digitalis, 4 minims; liquor strychninæ, 2 minims; and spirits of chloroform, 5 minims, in water.

One hour afterwards, when the dose was repeated, a change for the better was ob-

servable. Of the two motions passed, the last had been accompanied with the very slightest tendency to faint, there was less restlessness, and the pulse had improved. The third dose was given after an interval of two hours, and half an hour afterwards the patient fell into a deep sleep, which, with intervals for the taking of the mixture, now given every four hours, and for food lasted twenty-four hours. Recovery from this point was rapid, and no relapse followed.

This case occurred in 1889. Since then Hendley has used strychnine alone, or combined with tincture of digitalis or salicylate of sodium, in a very considerable number of cases in which diarrhœa has been accompanied with symptoms denoting a general want in tone, and with much success. The last very important case occurred in a native woman, who had four days previously been confined of twins. She had been attended by partly-qualified women-doctors, and everything that could be done had been done. She had lost much blood, she had fever ranging from 102° to 103° F., and her condition when the author saw her was much the same as that already described in the other case,—plus an ill-contracted uterus. No success had attended efforts to stop the diarrhœa by means of astringents, and when the writer saw her she appeared to be beyond hope of recovery. Astringents were at once stopped, and a mixture containing liquor strychninæ, 5 minims; tincture of digitalis, 5 minims; and liquor bismuthi and ammonii citratis, 8 minims in dose, was given in peppermint-water, for the first three doses, every two, and then three, and later, four hours. Here the immediate effect was not very evident; but later on there was very marked improvement, the extreme feeling of cardiac distress during the passing of a motion soon passed off, and stools became less watery, but in the first forty-eight hours decreased frequency was not apparent. The patient made a slow but complete recovery.

Mr. Hendley is not inclined to consider strychnine and digitalis of value in diarrhœa other than such as described. There can, however, be no doubt but that astringents often do more harm than good, and that opium, especially in cases of diarrhœa with hepatic congestion, tends eventually to a fatal issue. Strychnine appears to him to have a much quicker action on both the muscular system and the blood-supply of the intestines than it is generally credited with, though it is doubtful if in medicinal doses it has any effect in creating or increasing peristaltic action.

Regarding the use of digitalis with strychnine, he has long looked upon the two drugs as very efficient companions in other morbid affections under allied conditions, and there is little doubt but that the combination is one of much value, and capable of yielding marked and very satisfactory results.

PRESCRIPTIONS FOR GONORRHŒA.

The following prescriptions are given in *La Presse Médicale Belge* for August 7, 1892.

CASPARD is credited with the following:

℞ Powdered sweet almonds, ʒvii;
Catechu, gr. xxx;
Marshmallow, a sufficient quantity.
To be taken in twenty-four hours.

BEYRARS is credited with the following:

℞ Copaiba, ℥i;
Calcined magnesia, gr. xlv;
Powdered catechu, gr. lxxv;
Powdered cubebs, ℥iss;
Essence of peppermint,
Cinnamon (essence), of each, gtt. v.
One-fourth of this should be taken each day.

As an electuary, FOURNIER is stated to recommend the following:

℞ Powdered cubebs, ʒiii to ʒvi;
Syrup of tar, a sufficient quantity.
To be taken in six or seven doses every day.

DIDAY is stated to recommend the following:

℞ Balsam of copaiba, ʒiii;
Powdered cubebs, ʒiv;
Powdered jalap, gr. xlv;
Powdered opium, gr. iv;
Syrup of pale roses, a sufficient quantity.
This may be taken in the course of three or four days.

INJECTIONS FOR SEAT-WORMS.

℞ Lime-water, ℥iv;
Perchloride of iron, gtt. x.
To be used as an injection morning and night.

Or,

℞ Quassia, gr. xlv;
Distilled water, ℥iv.
Macerate for twenty-four hours, filter, and use the filtrate as an injection daily. This should be preceded by an ordinary injection, in order to remove fæcal matter from the bowel.

Or,

℞ Cod-liver oil, 2 tablespoonfuls;
Yolk of an egg (No. 1);
Water, ℥iv.
Make into an emulsion and use as an injection.

—*L'Union Médicale*, July 1892.

TREATMENT OF DISEASES OF THE SKIN AND BEARD.

GOTTHEIL contributes an article upon this subject to the *Medical News* of September 24, 1892;

Treatment of Eczema of the Beard.—1. *Dietetic.*—Put patients of full habit, hemorrhoidal tendencies, and prone to excesses at the table, upon a carefully-regulated diet, mainly vegetable, with meat but once daily, and no alcoholics or coffee or tea. In obstinate cases a milk and farinaceous diet exclusively gives brilliant results. On the other hand, anæmic patients should be put on a full, roborant diet.

2. *General.*—Saline purgatives should be freely used in the plethoric, especially in the form of natural waters. Anæmic cases should have tonics, bitters, cinchona, iron, and strychnine. Alkaline diuretics are indicated in almost all cases, as:

℞ Potassii citrat., gr. xx;
Infus. tritici repentis, ʒss;
Infus. digitalis, ʒss. M.
Sig.—Twice daily.

Or,

℞ Potassii acetat., gr. xx;
Spts. æther nitrosi, ʒss;
Syrup. aurantii, ʒss. M.
Sig.—Twice daily.

Both are to be given in large quantities of water. Arsenic is useless, even in chronic cases.

3. Local treatment is most important. Remove all crusts by soaking with olive oil, and, if necessary, by means of soap and warm water; but thereafter, as much as possible, avoid the use of water, which is irritant. Cut off the hair of the affected part to facilitate treatment. Apply one of the following ointments:

℞ Bismuthi oxidi, ʒi;
Glycerini, ʒss;
Ungt. aquæ rosæ, ℥i. M.

Or,

℞ Zinci oxidi, ʒi;
Acid. oleici, ℥ss;
Petrolati, ℥ss. M.

Zinc paint affords a thorough protection, and is very soothing.

℞ Zinci oxidi, ʒii;
Mucil. acaciæ, ℥ss;
Glycerini, ℥ss. M.
Sig.—Apply with a brush.

In the later, chronic stages, use the diachylon ointment; if the scaling still persists, tar or resorcin must be employed, as:

℞ Ol. cadini, ʒss;
Pulv. zinci oxidi, ʒii;
Amyli, ʒii;
Adipis, ad ℥i. M.

Or,

℞ Resorcini, gr. xv;
Lanolini, ℥ii. M.

Treatment of Perifolliculitis Barbæ.—In a purely local disease, dietetic or general treatment is not necessary, save in so far as applies to the removal of any irritant—cosmetics, snuffs—that may seem to have some etiologic relationship to the malady. Cod-liver oil, given internally, seems, as in so many other affections, to control the tendency to pus-formation; it should be given freely in obstinate or extensive cases. Calcium sulphide is absolutely useless.

Local Treatment.—The beard or moustache must be removed from the area affected, as it interferes with treatment. Shaving is liable to further irritate the skin and to cut off the hair so short that it buries itself in the inflammatory papule and cannot be extracted. Have the hair simply cut close. Now epilate every affected hair in the area. If there are too many for one sitting, take them in sections. Hair-bulbs surrounded by pus are loose, and can be removed without causing pain; the proceeding is as rational as to open a furuncle and to remove the splinter of wood that causes an abscess. Even before suppuration has set in, every hair that is evidently the centre of inflammatory action should be pulled out. By this means a chief source of irritation is removed and free exit is afforded the sero-pus. In this way, destruction of the hair-follicles and their surroundings, as well as baldness and scarring, are best avoided.

For this purpose, a forceps, with flat, unserrated blades, is more convenient than the ordinary kind. Each hair must be extracted singly, traction being made in its axis. The operation is painful, but necessary; it should be repeated at intervals by the physician, since neither the patient nor his friends will have sufficient skill and fortitude to do it themselves.

The way being thus prepared, soothing ointments are to be used. A favorite of Dr. Gottheil is the following, which is sedative and very bland:

℞ Tinct. opii, ʒss to ʒi;
Acid. carbol., gr. x;
Ungt. aquæ rosæ, ℥i. M.
Sig.—Apply twice daily; keep on constantly.

A little later, when the first acute stage is passed, astringent applications are in order. Thus:

℞ Ungt. diachyli., ℥ss;
Ungt. zinci oxidi, ℥ss. M.

Or,

℞ Hydrarg. chlor. mit., ℥ss;
Petrolati, ℥i. M.

Finally, the following may be employed:

℞ Ichthyol, ℥ss;
Lanolini, ℥i. M.

It is well not to forget, and not to let your patient forget, that perifolliculitis of the beard is frequently a very obstinate disease.

Treatment of Tricophytosis Barbæ.—Here, again, general measures are useless.

Local Treatment.—Remove the crusts with olive oil, warm water, and soap; then get rid of the excess of hair by cutting,—not by shaving, for the reasons already given.

If epilation of the affected hairs is required in perifolliculitis, all of the hairs must be removed in ring-worm. It is impossible to tell with certainty which hairs are healthy and which are diseased. Hence every hair of the affected area and for some distance around it must be pulled out. The process is painful, for the hairs are often firmly implanted; nor does cocaine, either applied externally or injected, help matters much. The pain must be borne, for without removing the hair and opening up a route for our remedies no parasiticide can penetrate to the depths of the follicle in which the mass of the fungus is growing.

Even after epilation it is sometimes difficult to find an agent strong enough. Use at once:

℞ Hydrarg. chlorid. corrosiv., gr. ii to iv;
Glycerini, ℥i;
Aq. cologniensis, ℥i. M.
Sig.—Apply twice daily.

Start with the weakest solution, and rapidly increase its strength. For small diseased areas, emplastrum hydrargyri or unguentum hydrargyri does fairly well. A solution of the oleate of mercury—from five per cent. to ten per cent.—in oleic acid is of use, and should be painted on twice daily. But in almost all cases we are finally compelled to have recourse to mercuric chloride, and we might as well start with it. A twelve-grain-to-the-ounce solution has proved necessary in some few cases. Of course, such strong solutions must be applied by the physician himself; they cannot be intrusted to the patient.

AN OINTMENT FOR HEMORRHOIDS.

L'Union Médicale for September 8, 1892, recommends the following prescription for this purpose:

℞ Hydrochlorate of cocaine, gr. xviii;
Sulphate of morphine, gr. iv;
Sulphate of atropine, gr. iv;
Tannic acid, gr. xviii;
Vaseline, ℥i.

This ointment is to be applied to the hemorrhoids.

PURGATIVE PILLS.

L'Union Médicale for September 3, 1892, publishes the following formula, stating that PETER is responsible for the same:

℞ Powdered scammony,
Jalap,
Calomel,
Almond soap, of each gr. i.
Make into one pill.

THE RESTORATION OF THE APPARENTLY DROWNED.

DR. ALEXANDER contributes to the *Edinburgh Medical Journal* for August, 1892, a short article upon this subject, in which he points out that the directions generally given for the Sylvester or Marshall-Hall method of resuscitation are imperfect.

Death before drowning is the result of suffocation, either from the direct introduction of water into the air-passages, or from closure of the glottis, or by a combination of both these conditions. To attempt resuscitation with any possibility of success, the tendency to closure of the glottis should be removed, thus giving an opportunity for any fluid to escape from the bronchial tubes, and afterwards for the admission of air into the lungs.

In a paper by Dr. Howard, read in London Medical Society, October 22, 1888, it was demonstrated that the most effectual method of keeping the entrance to the larynx open during administration of chloroform, etc., was by forcibly extending the neck backward, which raised the valve. Shortly after this, when engaged in instructing a detachment of the medical staff corps on the subject, it struck the author forcibly that the simple procedure recommended by Dr. Howard was equally applicable in cases of apparent death from drowning, and that the instructions laid down in certain official manuals were erroneous, and the illustrations on the subject misleading.

The description given in the manual is as follows:

Dr. Sylvester's Method.—"Place the patient on his back on a flat surface, inclined a little upward from the feet. Raise and support the head and shoulders on a small firm cushion, or folded article of dress placed under the shoulder-blades. Draw forward the tongue, and keep it projected beyond the lips; an elastic band over the tongue and under the chin will answer the purpose; or a piece of string or tape may be tied round them, or by raising he lower jaw, the teeth may be made to retain the tongue in that position." Then follow the extension movements. Any one who has tried to follow this description practically will be aware of the great difficulty, if not impossibility, of dealing with the tongue in such a manner, and the result of such procedure on the epiglottis is at least problematical, and many years ago Sir Joseph Lister showed that this method of raising the epiglottis was inefficient.

Dr. Marshall Hall's method is more scientific, and is thus described: "Place the patient on the ground face downward and one of the arms under the forehead, in which position all fluids will more readily escape from the mouth, and the tongue itself will fall forward, leaving the entrance to the wind-pipe free," etc. It appears to me very doubtful if this position will forcibly counteract the spasmodic closure of the glottis, but with the body placed on an inclined plane, feet raised, and the head more forcibly extended backward, there would be a better chance for establishing artificial respiration.

In Dr. Alexander's lectures of instruction on this subject he has been in the habit of teaching a combination of the two plans,—Sylvester's and Marshall Hall's. Having first placed the patient on his back on an inclined plane, with the feet raised and the head thrown forcibly backward, which insures the raising of the epiglottis, thus affording a means of exit to any fluid in the air-tubes, and likewise a means of entrance for air when artificial respiration commences, with an assistant to steady the feet, the forearms are seized and forcibly extended above the head, then brought down suddenly to the side, a hand of each operator at the same time pressing downward the ribs in front; the patient is then rolled over, taking care that the face is not injured, then brought back quickly to original position. This is to be repeated eighteen times to the minute, and always to the same side, till natural respiration is established, as it seems in accordance with reason that if water has invaded the lungs, it would give the person a better chance of resuscitation to thus clear one lung by gravitation and expulsion, and when life was restored then to vary the position. Warmth should, of course, be promoted by friction and hot flannels if available, care being taken not to give the *coup de grace* by pouring brandy or other alcoholic drink into the mouth before the power of swallowing is re-established.

There is nothing new in this method except in the application of previous methods. The subject was fully explained, so far back as November, 1863, by Dr. Robert L. Bowles, yet practices which were then and subsequently demonstrated as impossibilities have been allowed to reappear in our text-books all these years. It is in the hope of improving the teachings of this subject that Dr. Alexander brings it forward again in 1892.

THE APPLICATION OF ICE TO THE SPINE AS A THERAPEUTIC MEASURE.

Just at present the employment of heat and cold in therapeutics is interesting the profession so largely that an article by Dr. Kinnear, of New York, upon the application of ice to the spine in various functional and chronic diseases is of interest.

After quoting the work of Dr. John Chapman, of Paris, upon neuralgia and kindred nervous diseases, in which Dr. Chapman urges the employment of the spinal ice-bag as an important remedial measure, Dr. Kinnear details his own experiences with it. He points out that Chapman showed that by this means it was possible to overcome the coldness of the extremities frequently seen in nervous or hysterical persons, and that frequently hyperæsthesia of various portions of the body could be overcome in this way. As a rule, the application was found to be soothing and to exercise a pleasant effect upon the patient, although most of them before it was applied were firmly convinced that the results of the application would be unfortunate. Dr. Kinnear states that a patient of his reported to him that since using the ice-bag her legs and feet had become warmer, that her head was much clearer, that her temper was less irritable, and that the application "quiets and soothes the constant restlessness to which I am generally subject."

In addition to this, it relieved reflex excitability, so that she was not startled by loud noises. These results were obtained after a treatment lasting about three weeks.

Dr. Kinnear also states that in cases of eczema and pruritus, the ice-bag will sometimes

give relief when all other remedies fail, and that it will also relieve mental worry. The ice-bag should be applied to such portions of the spine as seem tender upon pressure.

SUTURE OF THE LUNG.

The Paris correspondent to the *Medical Press and Circular* for August 17, 1892, records a case of suture of the lung reported by GUERMONPREZ.

A young man, aged 18, entered the hospital for pleurisy, which became rapidly a pyopneumothorax, and for which the speaker opened largely the pleura, and finally had to perform Estlander's operation, on account of a persistent broncho-pleural fistula. Portions of six ribs were removed, and thus it became easy to find the inferior orifice of the fistula. The two lips were drawn together by means of a catgut suture, and immediately the air ceased to pass; convalescence was tedious, but in the end the man was able to resume his work.

ANTISEPTICS IN MIDWIFERY.

In the *Medical Press and Circular* for August 17, 1892, BURTON contributes an article upon this subject. While some of his statements are correct, it is to be remembered that in a large number of confinement cases the antiseptic measures, some of which he is inclined to think are unnecessary, are in reality absolutely necessary for the preservation of the patient's health and life. We think it is better to err on the side of too much rather than too little antisepsis under these circumstances. This question, in the shape of absolute cleanliness, is one of the most important subjects in obstetric art. During the past year it has been discussed by a number of German obstetricians, who, we all know, are distinguished by their firm adhesion to principles, and by their rigid carrying out of rules, even in minute particulars. The first name is that of Dr. Schultz, assistant in the gynæcological clinic at Buda-Pesth. Since the year 1887 disinfection of the most rigorous kind has been carried out in that institution during labor and puerperium. After every vaginal examination the vagina has been irrigated with a three per cent. solution of carbolic acid, and "naturally" the arms and hands of the examiner have been most laboriously disinfected before each. Immediately after labor also the parts have been irrigated, if instruments or the hands have been introduced into the vagina during the act of birth, and the vestibule have been exposed in search of rents or abrasions. The latter have been dressed with iodoform, the former united by suture. During childbed the patient has had a vaginal wash twice daily; the vestibule has been exposed by separation of the labia and irrigated, or powdered with iodoform. The vagina has been syringed out only when the discharge has been fetid.

It was believed that infection from without was effectually obviated by these means. Deaths from sepsis sank, but the morbidity remained very great. It was then concluded that bacteria might enter through the opened vestibule, and the procedure was accordingly altered. For six months, for the sake of experiment, every second patient was treated in the way described, and in the remaining ones the irrigations of the vestibule and ostium were omitted, but external washings were continued. The result of this experimental treatment showed that in the first class of cases, those in which the labia were separated, of one hundred and six women, sixteen became ill, or fifteen per cent. In the second class, in which external washing only was carried out, of one hundred and fifteen women, two only, or 1.79 per cent., became ill. The experiments, therefore, showed, what has been all along inculcated, that too meddlesome midwifery is bad. The author believes that routine douching is to be avoided, as it may be a source of danger; and Runge and Hofmeier have shown that in the case of epidemics the disease has first stopped on ceasing vaginal injections. Dr. Hermann Freund, of Strasburg, next takes up the subject in the *Berliner Klinik*, Heft xxix. He points out that modern antisepsis, so called, still leaves much to be desired as regards results. In Alsace and Lorraine, at the patient's homes, the maternal mortality has for years averaged .3 per cent., while in many institutions it has been reduced to *nil*. He believes the more unfavorable results in city and country practice to be due to faulty carrying out of antiseptic treatment on the part of midwives and physicians. The principles on which he has conducted one thousand labors without a death from infective disease are the following:

1. Keeping up the general condition, and the use of a suitable bed.

2. Laborious subjective antisepsis.

3. Objective antisepsis: Washing the genitals with soap and water, and with a two per cent. carbolic, or a one per cent. creoline so-

lution. Sublimate is not used, but the external genitals are thoroughly disinfected. Before the first vaginal examination the vagina and os uteri are irrigated with a similar solution, and the same after the expulsion of the child; but in the interval only when the labor is long and infection has been known to exist.

4. Proper management of the after-birth: In normal cases the expectant method, otherwise the placenta is actively removed.

5. During puerperium, generally speaking, no vaginal douches.

Of the eleven hundred cases, two hundred and thirty-five terminated spontaneously. Forceps were applied two hundred and six times (Tarnier's, forty-two). Turning and extraction, one hundred and twenty-four times. The author is opposed to the practice of preventive turning (twelve cases), and only allows it in flat pelvis. In the one hundred and twenty-four turnings, four mothers died; fifteen had pyrexia.

There were twenty cases of placenta prævia; two died. Combined version was not practised in all cases; frequently rupture of the membranes sufficed; occasionally tampons were applied. There were fifty-eight high extractions, without a death, and twenty-seven perforations, also without a death. There was one Cæsarean section post mortem. In one hundred and thirty-eight cases the placenta, or portions of it, were removed manually without a death. He attributes his good success, and considering the evidently unfavorable class of cases they must be acknowledged to be good, mainly to his antiseptic precautions. He appeals to teachers to inculcate the principles of antisepsis in midwifery more thoroughly.

Dr. Brosin, of Dresden, discusses the question, Shall the internal genitals of healthy women be disinfected during labor or not? Not content with his own observations, he quotes a number of authors in support of his contention that routine vaginal injections are not desirable. Mermann maintains that, however harmless vaginal injections may be in hospital, they may be dangerous in midwives' practice.

Poton says that if time and trouble are given, and the woman is spared pains, good results will be obtained, and this we all know. Leopold, of Dresden, speaks of the good results that have been obtained there since injections were abolished. In a statistical work on the increase of puerperal fever in Baden, Professor Hegar attributes it to the carrying out of antiseptic regulations, which open a channel for the admission of pathogenic germs into the genital tracts, and which favor fussiness (vielthuerei). Von Szabo found that in three thousand six hundred and eight women, in eighty per cent. the puerperium ran an apyrexial course without vaginal injections. Boekelman sees a danger in injections, inasmuch as by them the normal physiological mucus is removed. Axmann, who for forty years was director of the Training Institute for Midwives at Erfurt, says, "The internal disinfection of healthy women is injurious, and an abuse that ought to be stopped." The author then summarizes his own conclusions as follows: 1. Complete and permanent sterilization of the genital tract during labor is most difficult to attain. 2. Incomplete disinfection does more harm than good. 3. Vaginal injection for disinfection during labor should not be made by either practitioner or midwife. 4. In clinics and teaching institutions a method of procedure should be practised and taught that meets the requirements of practice.

S. Chazah, in *Volkmann's Sammlung Kl. Vortr.*, also discusses the subject under the title, "Disputed Points in the Puerperal Fever Question." Too much space has been taken up with previous writers to allow more than bare conclusions to be noted. He would adhere to the following rules for procuring asepsis: First of all, he would take care to have pure air. He would take the greatest pains to keep the clothing free from soil, both that of the obstetrician and that of the patient. He would remove the secretions from the patient, both laboring and lying-in, as speedily as possible, and disinfect all the articles that come into contact with her. He would keep away all physical and psychical disturbances, and avoid all superfluous manipulations of the genitals of the patient. In case of operation that permits entrance of air into the genital tracts he would disinfect by irrigation. Every infection during or before the birth-act comes from the hands, or instruments, or the air.

Dr. P. Steffeck, on the other hand, as an adherent of the doctrine of auto-infection (*Zeitsch. f. Geburts.*, Bd. xx.), claims to be in agreement with Kaltenbach on that point: his view is that germs may find their way into the genital tracts before or during pregnancy, and first develop toxic properties during or after labor. In support of his theories he inoculated rabbits with vaginal mucus taken from healthy women who had not been

previously examined. In twenty-nine experiments, twelve had a positive result,—seven developing abscesses and five dying. In these twelve cases the streptococcus albus or aureus was found in the vaginal secretions, but not in those of the seventeen in which the results were negative. Death also followed inoculation with pure cultivation of the organisms thus obtained. As a result of his investigations, he recommends, and has carried out, routine disinfection of the genital tracts in his obstetric cases, but he does not advise that midwives should be taught to practise it. In the Wurzburg Clinic, in four hundred and thirty-nine labors so treated, there has been a morbidity of 6.5 per cent., figures that do not say much in favor of his practice, whatever they may do from a theoretical point of view, as better results were obtained by Mermann without antiseptic vaginal washings.

Upon the whole, we may conclude that due regard to cleanliness, without fussiness and meddlesomeness, will give quite as good results in obstetric practice as the more painstaking system of disinfection.

Dr. J. Veit, of Berlin, is of opinion that all manipulation of the genital tract during labor is a source of danger, and would in consequence abolish all vaginal examination, except under special circumstances. He finds some support in the late Professor Litzmann, of Kiel, who would only allow students of his clinic to make external examinations, and expected them to become so proficient in these that all information regarding presentation, etc., could be obtained by them alone. A surgeon, he says, would not pass a clean probe over a wound without cause, and just as little should an obstetrician run the risk of introducing germs along with his finger into the vagina without justification. Just as we always have the poor with us, so we shall always have crochets and crochet-mongers, and the moral to be drawn from Dr. Veit's proposition is that vaginal examination should not be made needlessly and without due precautions.

A FORMULA FOR THE ADMINISTRATION OF THE SALTS OF STRONTIUM.

A note in the *Revue de Thérapeutique Medico-Chirurgicale* for August 1, 1892, states that the bromide and iodide of strontium are prescribed in the same manner as are similar salts of sodium, with the difference that they must be given in larger doses,—namely, from two to four drachms a day; doses which in the case of the potassium salt would produce too much gastric intolerance. The following prescriptions are given for the use of the bromide of strontium:

℞ Syrup of orange, ℥vi;
Syrup of bitter orange, ℥vi;
Powdered bromide of strontium, ℥i.
A teaspoonful to be taken at a dose.

A solution of the iodide of strontium may be given in the following manner:

℞ Distilled water, ℥x;
Iodide of strontium, ℥v.
A dessertspoonful at a dose.

Lactate of strontium is administered in the dose of 90 to 120 grains a day, and the nitrate is prescribed in cases of articular rheumatism.

The following prescription is given for the lactate of strontium:

℞ Pure lactate of strontium, ℥xiv;
Distilled water, ℥viii.
Dessertspoooful at a dose.

The dose of the nitrate of strontium is 6 drachms or more a day.

PRESCRIPTION FOR SUMMER DIARRHŒA.

The *Medical Press and Circular* for August 17, 1892, gives the following prescription:

℞ Oxide of zinc, ℥i;
Bicarbonate of sodium, gr. xxxviii;
Tincture of rhubarb, ♏xxx;
Spirits of chloroform, ℥iii.
Water, ℥ii.
Tablespoonful every half-hour.

INJECTIONS FOR ACUTE VAGINITIS.

The *Journal de Médecine de Paris* for July 31, 1892, gives the following prescription for this purpose:

℞ Sulphate of iron, ℥vi;
Distilled water, Oii.
Make into a solution.

Or,

℞ Hydrate of chloral, ℥i;
Distilled water, Oii.
Make into a solution.

Towards the close of an attack of acute vaginitis plentiful injections of one of these two solutions may be employed. During the day the vagina should be tamponed by wool soaked in the following:

℞ Glycerin, ℥iss;
Tannic acid, gr. xxv.

Every other day the mucous membrane of

the vagina should be painted with a solution of the nitrate of silver, in the proportion of 1 to 30. At the onset of acute vaginitis the inflammation is to be combated by the aid of injections of hot water.

The following is useful:

℞ Coca leaves, gr. lxxv;
Boric acid, ʒvi;
Emulsion of sweet almonds, ʒvi;
Water, Oii

Make an infusion, and use three or four injections a day.

A LOTION FOR BURNS.

℞ Carbolic acid, ʒiii;
Glycerin, ℥viii;
Distilled water, ℥viii.

Make a solution, and employ as a lotion over burns of the third degree.

The application should be made every six hours. After the blebs have formed and have been punctured the surface may be dressed with a preparation of iodoform and vaseline (10 to 100). In this way the surface is made antiseptic and is protected from the atmosphere.—*L'Union Médicale.*

THE TREATMENT OF ALOPECIA BY IODATED COLLODION.

E. Tison (*L'Abeille Médicale*, May 16, 1892) describes the successful treatment of alopecia by iodated collodion. The disease occurred in a young man, 19 years of age, and was what is commonly termed premature baldness. The author insists that such disorder must be distinguished from the similar conditions produced by the *achorion Schœnleini* and the *trichophyton tonsurans*. When first placed under treatment the patient had seven well-marked bald spots. He was advised the local application of the solution recommended by Bidet (cantharidine in chloroform), and a mixture of turpentine and oil. No good resulted. He then tried a secret remedy, but no benefit ensued, and he was finally, under the author's care at the hospital, put under the iodated collodion treatment. The details of the case are exceedingly interesting. On the 1st of December, 1891, the remedy in question was applied over five of the spots, and over the two others tincture of iodine by itself; on the 4th, a new application of the tincture of iodine; on the 7th, the pellicle produced by the collodion was removed, and lotions with Van Swieten's solution were applied, these lotions being repeated morning and evening on the 8th; on the 9th, new application of the collodion; from the 10th to the 15th, daily applications of the tincture of iodine; on the 17th, again lotions with Van Swieten's solution; on the 18th, iodated collodion and tincture of iodine; on the 22d, removal of pellicle and washings with corrosive sublimate; on the 31st, application of collodion over all the spots; on the 8th of January, removal of pellicle, and washings with corrosive sublimate; the treatment was interrupted on the 17th; on the 19th it was resumed by new application of iodated collodion. The patient then left the hospital to return to his studies. On the 12th of March following he reported success; all the spots were covered with growing hair, except the one situated over the right temple, the very spot which for a long time had been treated with the tincture of iodine alone. The author believes, in conclusion, that iodine by itself is unable to act successfully against the parasite of alopecia, and that the presence of collodion is indispensable, since this substance undoubtedly aids in maintaining the iodine in permanent contact with the skin, by preventing the sublimation of the volatile metalloid.

THE ABSORPTION AND ELIMINATION OF MERCURY IN THE HUMAN BODY, ESPECIALLY AFTER THE INJECTION OF THE SALICYLATE.

In an elaborate research upon the above subject, K. E. Linden (*Finska Lakaresaells. Handlingar*, March, 1892; *Rev. Internat. de Bibliog. Médicale*, May 10, 1892) has studied the following questions: 1. How soon does mercury appear in the urine after one or more injections? 2. How long does the drug remain in the system? 3. Is elimination constant? And, lastly, 4. What is the more or less exact proportion between the quantity of the remedy eliminated and the amount ingested? Of sixty-nine analyses made after the injection of .10 to .05 gramme of the salicylate of mercury, forty-eight gave a positive result and twenty-one a negative one. It was found that absorption was quite rapid, so that in the course of from two to two and a half hours, during which time three hundred centimetres of urine were obtained, the drug was detected in this liquid. The quantity of mercury increased rapidly during the first twelve hours, reaching its height on the second day, after which a rapid diminution followed. Ordinarily, elimination was effected towards the end of the first or the

beginning of the second week; but in many cases the drug was still found in the urine on the nineteenth day. The analyses made after repeated injections were one hundred and sixty in number, of which one hundred gave a positive and the rest a negative result. Compared with the preceding analyses, the results were similar during the first week and during the first days of the second week. After the last injection the quantity of mercury found in the urine increased towards the third or fourth day, after which it diminished gradually during the rest of the week and in the course of the following one. A positive result was observed in seventy and eighty per cent. of the total number of analyses made; it was negative only after injections of .05 gramme. During the third or fourth week, or after a single injection, only traces of mercury were found in the urine.

The examinations made in the second month after a mercurial treatment gave positive results in a twenty-four per cent. of the analyses, the quantity of mercury found being quite small. In fifteen analyses practised in the course of nine weeks, two and a half years after the last injection, a negative result was obtained. Regarding the elimination of the drug after injections of the salicylate of mercury, the analyses made show that it continued to take place while a trace of the drug remained in the organism, and that, in proportion to the quantity ingested and not to the duration of the intervals between the injections.

In four cases, in which injections of calomel were employed, eight examinations were made after a long time,—that is, in from eight months to two and a half years,—the salt having been employed in comparatively small doses; the analyses gave every time a negative result. After a treatment by frictions in three cases, the mercury made its appearance in the urine much later than after the injections,—that is, in from one to two weeks; but after its first appearance it continued to be eliminated during the whole treatment, and at least four weeks after. Thirty analyses were made in five cases in which the salicylate and the protoxide or the protiodide of mercury were employed in the form of pills. Even in these instances the mercury appeared in the urine much later than after its use by injections,—that is, not before the fifth or the sixth day,—and then in small quantities, which were still found on the nineteenth day after the treatment had been stopped. The analyses, made six and eleven weeks afterwards, showed the complete absence of the mercury.

BLEEDING FOR ACUTE ARTICULAR RHEUMATISM.

M. J. Pallardy (*L'Union Médicale du Canada*, May, 1892) reports the case of a man, 60 years of age, suffering from a marked attack of acute articular rheumatism, in whom no benefit was produced under the alkaline, purgative, and anodyne treatment. The case was particularly a severe one, even the articulations of the fingers being deeply affected. A pleuritic effusion on the right side of the thorax was the source of a difficult respiration, the enormous and forcible action of the heart being similarly distressing. Seeing that the treatment referred to had been of no avail, the author proposed bleeding, which was gladly accepted by the suffering patient. Sixteen ounces of blood were drawn from the arm, the immediate effect being marvellous. The articular pains disappeared rapidly, and with the continued administration of the alkaline and anodyne remedies during a week, the patient made a complete recovery. The same author refers to two other cases of the same disorder, occurring in individuals, 72 and 75 years, respectively, in whom the same happy results were obtained after other measures had failed to do any good. Pallardy claims that bleeding in such instances is soon followed by a diminution of the pains, and that it, besides, shortens the disease by a few days.

THE THERMAL TREATMENT DURING PREGNANCY.

Writing upon this subject, with especial reference to the remedial virtues of the springs of Saint-Sauveur, Caulet (*Bull. Gén. de Thérapeutique*, May 15, 1892) affirms that the use of those waters by pregnant women, victims of uterine disorders, is beneficial, and that the state of gestation, as has been supposed, does not prevent the therapeutic action of said waters. He has made eight observations, and found that in all of them the best results were produced. The baths, by modifying the genital disorders of pregnant women, prevent the occurrence of miscarriage, an accident frequently caused by those affections. The author then details two cases, in which favorable results, bearing upon the point under consideration, were obtained. One of the cases was that of a woman who had had, during two years, three

miscarriages as a consequence of the existence of a metritis. When she became pregnant again she was advised by her physician to take the baths of Saint-Sauveur. At the beginning of the treatment there she was suffering terribly from gastric troubles, constant vomiting, incessant uterine pains, and an extreme general weakness; but having carefully undergone the ordeal at the springs, she was finally, at full term, delivered of healthy twins. The author concludes, from the observations practised, that pregnancy is a condition favorable to the treatment of uterine affections, and that during such a period remedial measures act as well, if not better, than in the non-gravid condition of the uterus. He recommends, then, especially during the period of gestation, a general balneotherapic medication, which, in these cases, as in others, constitutes the treatment of chronic affections.

TREATMENT OF BUBO.

CORDIER, after determining the presence of pus in a case of bubo, opens the abscess with a bistoury and without pressure, and then injects 15 minims of a solution of fifty per cent. of nitrate of silver, after which he dresses the wound with iodoform. He states that he obtains a cure in from two to three days.

If the abscess has gone on very far and burrowed, it may be necessary to repeat the injection. After this the pus may be abundant for three or four days. The discharge then becomes serous, and a good cicatrix is formed. He claims that equally good results follow in inflammation of chancroid.—*L'Union Médicale*, June 14, 1892.

TREATMENT OF CERTAIN FORMS OF ULCER OF THE CORNEA BY AN OCCLUSIVE ANTISEPTIC DRESSING.

M. WARLOMONT ("Congrès de la Société Française d'Ophthalmologie," abstract in *Revue Générale d' Ophthalmologie*, June, 1892) believes that the treatment of ulcers of the cornea by an occlusive antiseptic dressing, as proposed by Dr. Valude, may be advantageous when modified by iodoform, an antiseptic very well borne by the eye. After the cul de-sac has been washed with a sublimate lotion of 1 to 2000, the ulcer is powdered with finely-pulverized iodoform. The dressing is composed of several thicknesses of iodoform gauze, antiseptic cotton, and a tarlatan bandage. The only contraindications are cases of abundant catarrh of the lachrymal ducts and purulent conjunctivitis. This dressing is especially effectual in ulcers of scrofulous and granular origin, with or without hypopyon. It is also indicated, though it is less effectual, when there is an infiltration of the cornea, and in still graver cases it should be combined with more powerful methods,—galvanocautery, paracentesis, etc.

TREATMENT OF INFECTING WOUNDS OF THE EYE.

M. DIANOUX ("Congrès de la Société Française d'Ophthalmologie," abstract in *Revue Générale d' Ophthalmologie*, June, 1892) thinks penetrating wounds of the eye, without the introduction of foreign bodies, may be primarily or secondarily infected, and active treatment may be performed before or after symptoms of infection are declared. In the first case, the toilet of the wound must be made as if an operation was about to be performed by careful aseptic precautions and dressings with bismuth or iodoform. The chances of infection are in inverse ratio to the size and even border of the wound. In the second instance, the cautery should be applied so as to destroy the infected points. Dianoux employs the thermo-cautery and a concentrated solution of methyl blue, which instantly colors the region touched, eserine is instilled, and the dressing is with bismuth. If there is suppuration from the deeper regions after cauterization of the wound, all the invaded tissues must be treated by prolonged irrigations under decided pressure, a liquid aseptic being used. Then the focus of infection is thoroughly cauterized, provided there is place to do it. Under these circumstances the whole eye may be preserved, and almost of normal size.

TRICHLORIDE OF IODINE AS AN ANTISEPTIC IN DIFFERENT OCULAR AFFECTIONS.

M. PFLÜGER ("Congrès de la Société Française d'Ophthalmologie," abstract in *Revue Générale d' Ophthalmologie*, June, 1892) praises the use of trichloride of iodine in a solution of 1 to 5000 as an ordinary antiseptic, and a solution of 1 to 2000 and 1 to 1000 as a strong antiseptic in cases of infectious lesions of the eye, either superficial or deep. In incipient panophthalmitis he uses a solution of 1 to 10,000.

M. Vacher thinks that for intraocular injections an aseptic will answer, and prefers the physiological salt solution with carbonate of sodium.

M. Pflüger believes that a solution of this character may be used if the region is not infected, but if there is any panophthalmitis, he prefers a germicide.

WHAT CAN BE DONE FOR INCIPIENT CATARACT.

Dr. Edward Jackson (*Philadelphia Polyclinic*, September, 1892), in discussing incipient cataract, comes to the following conclusions in regard to its treatment:

The view that for incipient cataract nothing can be done is certainly incorrect. In avoiding and disclaiming the pretensions of charlatans, the profession has failed to see all that can be done for the success of this condition. It is clearly established that a considerable number of cataracts remain stationary, even for many years. The conditions that tend to produce opacity in the lens are certainly to some extent amenable to therapeutic and hygienic measures at our command. Whether the opacity that has already developed ever tends to diminish is, perhaps, an open question, but Jackson's belief is that opacities of certain kinds do show this tendency. In any case one may with very good reason hope to check the process where it is, and prevent further deterioration of vision in a considerable proportion of cases, though not in all. Again, eyes in which cataract is progressing rapidly are usually affected with opacities of the vitreous, or, as urged by Dr. Risley, choroidal inflammation or irritation, which is known to be to some extent amenable to treatment. The removal of these conditions quite often brings about a notable improvement in vision. In the main, the treatment is to be directed to improving the choroidal nutrition, since it is through the choroid that the vitreous and lens draw their nutritive supply. The first step in this direction is the avoidance of eye-strain by the use of proper glasses, and by enforced systematic abstinence from close eye-work. This may involve a radical change in the habits and pursuits of the patient; but with the hope that such a change may prevent the occurrence of cataract, this change may often be made. After the avoidance of eye-strain comes protection of the eyes from exposure to excess of light and heat; and beyond this our dependence must mainly be on what will influence favorably the general nutrition. The cure of dyspepsia is of the first importance. Increased nutrition is needful in a large proportion of old people. Freedom from worry and abundant sleep are valuable in all cases. Close investigation will commonly show that the ocular trouble has appeared and developed during some period of especial ill health. The special treatment that such a condition requires is an essential part of the treatment of the cataract. As to the application to the eye or manipulations of the eye for the specific removal of cataract, many have been urged and much has been claimed for them, but none has stood the test of experience in the hands of unprejudiced observers.

CATARACT OPERATIONS AND AFTER-TREATMENT.

A. W. Calhoun (*Virginia Medical Monthly*, August, 1892) draws conclusions from nine hundred and four cases of cataract operation. His preparatory treatment is as follows: Any inflammatory condition of the eyeball or lid is corrected. The nasal duct is examined and abnormities removed. On the night previous to the operation, a simple purgative, and sometimes five grains of quinine are administered as a routine treatment. The operation is made upon the patient in bed, and he is kept there for several days afterwards.

To secure antisepsis he pursues the following plan: The patient's face is thoroughly washed with warm water and Castile soap. The conjunctiva of the eyeball and lid is irrigated with a bichloride of mercury solution, 1 to 10,000. The lid is everted and washed with the bichloride solution, and by means of a pipette, the eyeball, cornea, and conjunctiva are flooded with the same lotion. The ordinary surgical rules, so far as the hands of the surgeon and assistant are concerned, are carried out. Cocaine is used as an anæsthetic in the following prescription: Muriate of cocaine, ⅓ grain; bichloride of mercury (1 to 10,000), 1 drachm. Both eyes are cocainized, although only one is operated upon at one sitting. The instruments are prepared by dropping them in boiling-water by the bedside, and leaving them there for a few moments. They are then taken out and dried upon absorbent cotton. Before the instrument is used it is momentarily placed in the bichloride solution. Great stress is laid upon the purity of the atmosphere of the room in which the operation is undertaken.

Calhoun is opposed to hastening a cataract to maturity by needling it. He prefers a preliminary iridectomy. Although he considers that simple extraction has many advantages, he prefers extraction with iridectomy, chiefly because there is less likelihood of cortical substance remaining behind, and consequently less need of a subsequent operation for after-cataract. He lacerates the capsule freely, and delivers the lens by gently pressing upon the lower corneo-scleral margin. The speculum is then removed, the lens delivered, the patient allowed to rest for a moment, and any remaining cortical substance is dislodged. After the operation is finished, he washes the lower lid with the mercury solution freely, and allows it to come in contact with the eyeball itself. He is not averse to allowing some of the fluid to enter into the anterior chamber.

So far as bandaging is concerned, he considers the safest plan to take a piece of absorbent cotton, moisten it with white vaseline, and fill out the cavity of the orbit above the closed lid, and hold it in place with figure-of-eight turns of a flannel roller bandage an inch and a half wide. He dresses his case twice a day during the first four or five days by simply removing the bandage and bathing the outside of the lid with bichloride of mercury lotion. After the patient has been in bed from four to six days, he liberates one eye, but keeps the other bound until he is ready to dispense with the bandage entirely.

THE SURGICAL TREATMENT OF GRANULAR CONJUNCTIVITIS.

The following views were expressed in the Congress of the French Society of Ophthalmology, in its session of May, 1892, concerning the surgical treatment of granular conjunctivitis, and are given in abstract in the *Revue Générale d'Ophthalmologie*, May, 1892, p. 235:

Repeated Scarifications. — Wicherkiewicz thinks, when there are abundant and prolific granulations, that nothing yields as satisfactory results as scarifications of small extent, made with an instrument provided with stubby points and guided in different directions. After the scarifications he cleanses with solution of sublimate, 1 to 5000; but, above all, limits himself to the scarifications, without following them by brushing. He repeats the scarifications every ten or twelve days, and even corneal lesions are not a contraindication, although they deserve a specially appropriate treatment.

Brossage.—Abadie has been interested to know what results the method of "brossage" would yield in countries where granular conjunctivitis assumes the most serious forms and where the disease is most prevalent; hence Dr. Viger has experimented in Algeria with the surgical treatment in question,—viz., complete retroversion of the eyelids, with the assistance of chloroform narcosis, deep scarification and brushings with a sublimate solution, 1 to 500. He has obtained excellent results, superior to all those which other methods of treatment formerly gave. Dr. Petresco, in Bucharest, has communicated to Abadie a long investigation, in which he says that deep scarifications and brushings with sublimate solution are preeminently the chosen methods in granular conjunctivitis. Operating in the very midst of a region where trachoma is extremely prevalent, he has treated more than five hundred patients, and has had only two or three per cent. of failures. Recovery was effected, on the average, in three weeks, while formerly by cauterizations it took whole years. There is no complication to be feared if the proper precautions to turn back the eyelids on the following days are taken, and to wash them either with a sublimate solution, 1 to 500, or even with a boric acid solution. Great care must be taken when a new brush is used to extract the fat, either with boiling water or with alcohol or ether, and then to disinfect the instrument by plunging it in a solution of sublimate, 1 to 500, for at least one hour. Failure in this precaution may cause infection of the conjunctiva of animal origin and be injurious to the success of the operation.

M. Panas thinks that in *acute* granular conjunctivitis nothing is worse than brushing, or any other surgical method. Operations in these cases lead to symblepharon. They are properly managed with applications of nitrate of silver. When the affection is subacute, the various caustic remedies may be employed, or massage after the manner of the ancients. Scarifications and brossage may also be used, and these operations are admissible in cases where the indications for jequirity are present, —that is, when corneal pannus exists.

Darier believes that the object of brossage is to substitute the nitrate of silver treatment when the latter is fruitless. Scarifications should be done with a knite composed of parallel blades, and the conjunctiva must not be destroyed by too vigorous brushing, as Manolescu does.

Martin thinks this treatment is very effectual, and has succeeded with it where he has

failed with every other remedy, but it is not free from several complications. In one instance, a myopia of six dioptries and an astigmatism of three dioptries, with a V = ½, occurred unexpectedly in an eye which was emmetropic, and the cornea of which was normal before the treatment. He does not advise brossage when the cornea is intact and is in danger of being mutilated.

Wecker declares that brossage is indicated only in dry forms of granular conjunctivitis. In the purulent varieties it is a detestable practice.

Truc referred to the fact that in trachoma it is not only the granulations, but also the constitution which gives the disease its special characters, and which must be taken into consideration in connection with the treatment. He is favorable to scarifications in proper cases.

Chibret advocates in the treatment of granular conjunctivitis a residence in favorable localities; for example, at a height of twelve hundred feet and more or, under other circumstances and in certain regions, at the seashore.

Maréchal agrees with Wicherkiewicz that brossage is an unacceptable operation. He greatly prefers rolling with a blunt and smooth instrument on a resistant surface, over which the eyelid is drawn. To aid in this rolling process he makes scarifications, not parallel with, but perpendicular to, the palpebral edges.

Galezowski praises the excision of the cul-de-sac which has become granular, and the cure is then completed with frequent touchings with nitrate of silver.

Vignes is satisfied with simple massage with boric acid.

Cristoff uses the sulphate of copper; and Wicherkiewicz would readily agree with Galezowski in excision of the cul-de-sac if the granulations were confined to this fold, but this is scarcely ever the case.

GUNPOWDER INJURIES TO BOTH CORNEÆ, IRIDES, AND LENSES, WITH SUBSEQUENT RESTORATION OF VISION TO ALMOST FULL ACUITY.

At the meeting of the American Ophthalmological Society, held in New London, July, 1892, Dr. Charles A. Oliver contributed the history of a case of gunpowder injuries to both eyes, resulting in a desperate state of affairs, induced by superficial and deep traumatism, with the entrance of foreign material in the substance of the irides and lenses, which terminated, after careful treatment, in the restoration of almost full acuity of vision.

In the right eye the iris was wounded in its lower portion, directly opposite a large corneal break, and several grains of powder could be seen lying in a rather deep and dense blood-clot situated at the lower angle of the anterior chamber. The lens was swollen, and rapidly became opaque. Finally, the eye passed into a state of secondary glaucoma, with all its symptoms. The previous treatment had been cold compresses, free irrigation with aseptic fluids, and the instillation of strong percentages of cocaine and atropine. On the appearance of the glaucomatous symptoms, the mydriatics were substituted by eserine, but as this drug failed to lessen the intraocular tension, an inferior iridectomy was performed, evacuating at the same time much of the lens-substance, the blood, and several grains of powder. The wound healed promptly.

In the left cornea there was a rather peripheral penetrating wound in the lower nasal quadrant, with a tear in the corresponding part of the iris-tissue, through which a powder grain could be seen sticking in the lens. Another deep wound, extending almost through the corneal substance, and holding some remnants of a powder grain, was observed in the upper, outer quadrant. The lens was slightly swollen, and the pupil irregularly dilated. The same local treatment previously described, together with removing as many of the free powder grains as was possible, was resorted to. In four days' time the lids became less swollen, most of the superficial powder remnants sloughed from the exposed portion of the eyeball, the pupil was fairly dilated, the lens but slightly swollen, and the intraocular tension normal. The left eye gradually improved.

When the patient was discharged from the hospital, two months after his injuries, there was considerable unabsorbed lens-matter in the left eye. The tension was normal. The right eye had also become comfortable and had a normal tension. Two weeks after his discharge, Dr. Oliver made a broad, round hole, of from four to five millimetres in diameter, in the lower half of the capsule of the right eye, taking care not to break the encapsulated mass just above it from its attachments, thus securing a vision of $\frac{5}{10}$, with a suitable glass; and performed a double discission of the left lens, securing, after correction, a vision of $\frac{5}{10}$. A year after the accident the eyes remained perfectly quiet, and the patient was able to attend to his work satisfactorily.

In addition to the happy outcome of such a very complicated and serious injury to the eyes, this case is interesting and valuable as an exposition of the totally diverse methods of treatment which were made necessary in the same patient. It is, further, of clinical value, in showing the good effects of removing as many of the loose powder grains from the interior of the eyes as possible, leaving but two small masses, which were encapsulated in safe positions.

THE CLINICAL VALUE OF REPEATED CAREFUL CORRECTION OF MANIFEST REFRACTIVE ERROR IN PLASTIC IRITIS.

Dr. Charles A. Oliver presented a paper before the American Ophthalmological Society, at its meeting in New London, July, 1892, on the subject contained in the title, and has endeavored to formulate some definite guide, and to obtain certain rules for correct and appropriate dosage of both local and general measures in the treatment of plastic iritis. After a most careful study of the subject, based upon a rich clinical experience, he arrives at the following conclusions:

1. In nearly every case of iritis, especially of the plastic forms, there is a period, even after full pupillary dilatation has been seemingly artificially obtained, during which, owing to the persistence of inflammatory changes in the uveal tract, as so well expressed by the clinical evidences of ciliary spasm, etc., graduated instillations of mydriatics should be employed, the duration and gravity of this period being most accurately measured and determined by the systematic and repeated estimation of the varying manifest errors of refraction.

2. While it is true that during this stage, in nearly every case of iritis, keratometric study seems to show at times that there are bizarre and curious changes of corneal curvature, yet it must be conceded from the additional findings of other optometric methods, that the bulk of the ametropic change in such case is due to perversion of lens-action from what Koller terms "spastic accommodation" as the result of ciliary irritation and inflammation.

3. In nearly every case of iritis the duration of this stage can be promptly shortened by the judicious and ready use of some quick and powerful intraocular muscle paralyzant, the character of the necessary form of the drug and its amount at the time in every instance being judged by the amount of manifest refractive error found at that time.

EXPERIMENTAL INQUIRY INTO THE ORIGIN OF CORNEAL OPACITIES AFTER CATARACT EXTRACTION WHICH HAVE BEEN LATELY NOTICED.

Mellinger (*V. Graefe's Archiv*, Bd. xxxvii., Ab. iv.) has made an investigation in regard to the corneal opacities under the circumstances noted in the title of this abstract. The conclusions of this paper have been summarized by W. G. T. Story in the *Ophthalmic Review* for July, 1892, and, as they touch upon important therapeutic considerations, they are here reproduced:

1. A solution of corrosive sublimate, 1 to 5000, if present for a short time in the anterior chamber, produces a parenchymatous opacity of the cornea, and if any of the solution remains in the anterior chamber a permanent opacity may result.

2. Cocaine alone produces no corneal opacity, but by its presence in the anterior chamber increases the effect of the sublimate solution by making the endothelium more permeable; its use also, by lowering the tension of the globe and favoring the collapse of the cornea, tends to cause the retention in the anterior chamber of the solutions used at operations.

Clinically, this sublimate keratitis in rabbits' eyes resembles exactly that observed in the human eye, after cataract extractions, where sublimate is used; they are almost certainly identical.

If sections of the opacity, when recent, are examined, the cornea is found to be thickened, the lymph-channels enlarged, and the corneal cells increased in number. This increase is, the author believes, only apparent; the endothelium is absent in specimens examined during the first eight days or so; no noticeable infiltration of cells from the neighboring parts was ever seen; pathologically, in fact, the opacity resembled that described by Leber (*V. Graefe's Archiv*, xix. p. 181) as occurring after wounds of the corneal endothelium (Quellungstrübung).

When the opacity has become permanent, the cornea is found to be no longer thickened; the epithelium, the endothelium, and membrana Descemeti are normal, but there are more corneal corpuscles to be seen in the opacity than in the transparent parts, and the corneal fibres are displaced, resembling rather the fibres of the sclerotic.

Even weak solutions of corrosive sublimate (1 to 10,000, 1 to 15,000) produce these opacities; but a three per cent. solution of boric acid, or a one-half per cent. solution of

sodium chloride, can be injected into the anterior chamber without any bad result, even when cocaine is used with them.

Other fluids, as distilled water, weak acids, alcohol, and especially the aqua chlorata, recommended as an antiseptic by Schmidt-Rimpler, produce opacities of various degrees of density and permanence when injected into the anterior chamber of a rabbit's eye. In the last hundred cataract extractions at Basel there have been no cases of corneal opacity, all the irrigations and washings out of the anterior chamber having been performed with boric acid solution.

A NEW METHOD OF OPERATING IN PTOSIS.

BIRNBACHER (*Centralbl. f. Prakt. Augenheilk.*, May, 1892), who is satisfied neither with Pagenstecher's nor with Panas's operation, has advocated a method of his own, which has been summarized by W. G. Sym in the *Ophthalmic Review* for July, 1892, in the following abstract: "An incision is made through the skin along the whole length of the lid corresponding to the upper edge of the tarsal cartilage, which is then cleared, and pierced by three double-needled stout silk threads. The middle one of these threads lies at the highest convexity of the tarsus, and the others at a distance of seven millimetres from it to right and left. The loops of thread are not knotted; both ends of the middle stitch are carried vertically upward under the skin, to emerge close together in the eyebrow, and the other stitches are next treated similarly, but they are caused to incline somewhat away from the vertical, so that the points of emergence of the three are farther apart than the points of entrance. The three stitches are then tied over three iodoform pads, the guide as to the degree of tightness to which the stitches are drawn being that, on closure of the eyes, the upper and under lids can still touch. The skin wound is then closed with five fine silk threads. By this method, with the minimum of damage to the skin (for the points of emergence of threads are hidden among the hair of the eyebrow), one obtains several short cicatricial bands, which have little tendency to stretch, uniting the tarsus to the frontalis muscle.

"The threads are left in, under an antiseptic dressing, for twenty to twenty-five days, after which time one can feel quite distinctly the new bands referred to.

"In a case in which he operated, and of which he gives a diagram, the note before operation was to the effect that on the left side the upper lid hung down flat and without fold, and that it remained immovable on an attempt to raise the eyes; when looking up the aperture between the lids only measured three millimetres (on the right side, twelve millimetres). The operation was performed under cocaine; the stitches were removed on the twenty-second day. The notes taken at the time of dismissal state that, when the patient was looking straight before her, the left eyelid was raised equally with the right; on looking upward, rather less; there was a slight fold in the skin of the lid, and the lids could be completely closed when desired."

NEW METHOD OF EXTIRPATION OF THE RECTUM.

SCHELKLEY (*Berlin. Klin. Woch.*, No. 32, 29. Jahr.) describes a method which, without wounding other important organs, exposes the pelvic organs, and particularly the rectum, to operative procedures.

He has employed this method in eight cases with most satisfactory results, in so far as the operative procedure was concerned.

The patient is placed on his back in the lithotomy position, with the buttocks slightly projecting over the edge of the table, and the pelvis elevated. An incision is carried from the border of the right inner ischiatic tuberosity to the coccyx, to the left ischiatic tuberosity. The coccygeal insertion of the external sphincter is divided close to the bone. By blunt dissection with the index-finger the levator ani is exposed, and is divided, by means of scissors, first on the left side, then on the right, following the direction of the skin wound. Ordinarily the posterior wall of the rectum at once presents in the wound.

When it is necessary to go high up in the pelvis, it is advisable to make a transverse resection of the coccyx. The skin and muscle-flap just loosened is carried up towards the symphysis, and is held there by an assistant. Then, by means of the finger, the rectum is freed from its surroundings, and divided transversely just above the external sphincter. The central end of the divided gut is seized in a pair of strong-toothed forceps, is drawn down firmly, and is freed by blunt dissection. Where it is held by firm, dense, or fibrous tissue, this can be divided between ligatures. When the dissection is carried so far that, after extirpation of all the diseased portion, the central end of the bowel can be brought into apposition

with the peripheral end without undue tension, the final section is made.

If Douglas's pouch is opened, it can be sewed before the extremities of the bowel are approximated. The author prefers to the operation of suturing the divided ends of the bowel, stripping the anal opening of its mucous membrane, and securing the proximal end in this position. The external wound is then closed, with the exception of an opening near the coccyx, through which the iodoform-gauze packing employed for drainage is allowed to protrude.

The incision above described gives plenty of room for operative procedure, and enables the surgeon to see plainly to the very bottom of the wound. It occasions but little bleeding, excepting when the coccyx is resected. No important organs are wounded, and the function of the sphincter is either partly or completely preserved. In order to temporarily paralyze the latter, so that after relieving the stenosis it cannot oppose the free discharge of fæcal masses, and therefore endanger the integrity of the suture, it is well to overstretch it.

TREATMENT OF FISTULA BY IMMEDIATE SUTURING.

LLOBET (*Annales d' Orthopédie*, tome v., 6 année) strongly advises immediate closure of the wound made in the treatment of anal fistula. He holds that by this method the weakening effect of prolonged suppuration is avoided; that the patient is spared the risk of temporary incontinence of fæces; and that the treatment is completed in about one-third the time required by the ordinary method. The evening before the operation the patient is purged, and on the next morning the bowel is washed out by means of an enema. The anal region having been shaved and thoroughly cleansed, a speculum is introduced, and a search is made for the internal orifice of the fistula. The grooved director is introduced through the external orifice, and the whole fistula, together with any blind pockets, is freely divided. Then, by means of a sharp curette, all fibrous or granulating tissue is removed. The whole surface is washed by a four per cent. boric acid solution; then, by means of a Hagedorn needle, the wound is sewed. These sutures are begun at the upper portions of the bowel wound; the needle is entered through the rectal mucous membrane on one side of the opening, is passed entirely beneath the denuded surface, and is brought out through the mucous membrane of the opposite side. A special suture is employed to unite the fibres of the external sphincter.

Finally, the skin wound is closed by means of a few superficial sutures. The operation being ended, the rectum is washed out, and a gauze tampon is inserted. Opium is administered for the purpose of keeping the bowels confined. On the seventh day an enema is given. On the eighth day the sutures are removed.

[This is an operation which may succeed in the simpler forms of anal fistula, and in that case much shorten treatment. In the severe forms of fistula it is entirely impracticable.—ED.]

RESECTION OF THE SHOULDER FOR THE CURE OF RECURRING LUXATION.

SOUTHEM (*Annales d' Orthopédie*, tome v., 6 année) treated by excision an epileptic woman, aged 45, who was completely disabled from work on account of recurring luxation of the shoulder, this joint having been thrown out at least fifty times. The head of the bone on exposure seemed perfectly healthy, but the glenoid cavity showed traces of an old injury, which greatly facilitated luxation. The head of the bone was resected, and rapid cure followed. The patient suffered no more from her luxation.

THE MANAGEMENT OF ECZEMA IN INFANTS AND YOUNG CHILDREN.

VAN HARLINGEN (*International Medical Magazine*, vol. i., No. 6) advises for the treatment of the erythematous eczema encountered about the buttocks, the administration of minute doses of calomel and soda, with the addition at times of a little rhubarb, and the correction of possible errors in the diet, as means adapted to changing the character of the stools and urine, and thus rendering them less irritative. The skin is protected from these irritating fluids by cleansing with mild soap and warm water, followed by careful drying with a soft towel and the application of a coat of vaseline. The proper soap to use for these cases is one which is as nearly neutral as possible. Even the finest Castile soap is not satisfactory in this respect. Unna's *basis seife* is, perhaps, the best to employ. If the eczematous conditions require additional medication, a very mild astringent lotion acts better than other forms of treatment. The black wash of the Pharmacopœia, alone or with an equal quantity of lime-water added, sopped on the skin, or applied on soft rags in the folds of the

skin from time to time, often acts surprisingly well. Powders are so apt to cake and crust that they must be employed with caution, and those containing starch should be avoided. Very finely-powdered talc, Fuller's earth, or, in some cases, the subnitrate of bismuth, are among the best.

When there are cracks and fissures, ointments may sometimes be used. The black wash, followed by an ointment of oxide of zinc and vaseline in equal parts, may be applied in small quantity. Now and then an ointment of subnitrate of bismuth, half a drachm to the ounce of vaseline, may be employed.

The same principles apply in the treatment of erythematous eczema about the neck, etc., only that no internal treatment of any kind is required in these cases.

In the other forms of eczema, when no particular indication for treatment presents itself, the administration of minute and frequently-repeated doses of calomel is often of the greatest service. The course should last for twenty-four or thirty-six hours, and should be repeated every five or seven days, or at the beginning of each recurrence. When the eczema occurs somewhat later,—about the end of the first year,—the teeth are almost always at fault. The moment the teeth appear through the gum the eczema subsides, hence nature may be aided by incising over the teeth.

In severe cases it is best to put the patient under some restraint, and administer remedies calculated not only to relieve the inflammatory symptoms, but to assuage the pruritus. Ointments of oxide of zinc are so adherent, on the scalp at least, that they are not convenient. It is generally best to use vaseline for the base, though lard may be substituted. Lanolin is so tenacious that it should not be used, except in combination with vaseline. One part of lanolin to 4 of vaseline makes a convenient excipient for whatever medication may be used.

In those somewhat unusual cases where there seems to be little or no pruritus, an ointment of boric acid—twenty or thirty grains to the ounce—may be prescribed. In other cases a drachm of subnitrate of bismuth to the ounce of ointment is of use. These ointments are best employed spread on linen rags or on strips of paraffin-paper. They should be cleaned off from time to time by the use of warm water and the *basis seife*, because decomposition and irritation soon occur under such dressings.

When there is pruritus it is well to have the various ointments gently rubbed into the skin in small quantities and at frequent intervals. The addition of three to ten grains of carbolic acid to the ounce of ointment will soothe the itching in most cases. Tar or oil of cade, in the proportion of a drachm to the ounce of ointment, is an excellent antipruritic; it is, however, much more disfiguring than the carbolic acid.

An excellent preparation in this form of eczema is the following:

℞ Precipitated sulphur,
Liquid pitch, aa ℥ss;
Ointment of zinc oxide, ℥i.

For regions where there is no hair, the zinc ointment is exceedingly useful. When the pruritic eczema is in the form of small patches, especially on the cheeks, when the discharge is not very pronounced, the following treatment is convenient:

℞ Oil of cade, ℥i;
Collodion, ℥i.

A coat of this pigment is brushed over the diseased area, and acts as an antipruritic, and also protects the diseased patch from the air, and to some extent from the hands of the child. It stings slightly when first applied, but this passes away almost immediately.

Scrofulous and ill-nourished children are very apt to suffer from vesicular and pustular eczema combined, or from the pustular form alone. Iron, cod-liver oil, extract of malt and quinine may be employed from time to time. As a result of very extensive experience, Van Harlingen holds that arsenic has no specific effect whatever in the course of eczema, and that even as a tonic its use is limited.

There is a form of protracted chronic eczema in children which occurs in those having a naturally dry skin; in fact, a tendency to the condition known as ichthyosis.

These cases are exceedingly rebellious to treatment. Locally, the same remedies may be used that have been already described, but must be supplemented in some cases, especially when the disease is extensive, and always when a general dry ichthyotic condition of the skin coexists by the frequent employment of baths. These should be warm, and should be medicated by the addition of a quarter of a pound of ordinary washing soda and a pint of clear starch to thirty gallons of water. For a young child's bath half of each of these preparations should be employed.

The patient should remain in the bath some time, and when taken out, should be dried without rubbing; appropriate applications are then made, and the patient is put to bed to avoid catching cold.

In the more chronic cases of eczema in children, when a few circumscribed, thickened, itchy patches, extremely resistant to treatment, represent the disease, it may sometimes be necessary to have recourse to strongly stimulating applications, with a view to excite enough reaction to carry off the infiltration. Tar, in ointments of various strengths, may be employed, alone or combined with a mercurial ointment, as in the eczema of adults. Washes of caustic potash, from five to twenty grains to the ounce, may be applied by means of a small swab brushed over the surface. These applications should not be allowed to remain, but should be quickly washed off, and followed by a soothing ointment. They should be applied cautiously at first, remembering the delicate character of the child's skin.

THE INFLUENCE OF ASEPSIS AND ANTISEPSIS IN THE PROPHYLAXIS OF URETHRAL AS DISTINGUISHED FROM URINARY FEVER.

BRYSON (*Journal of Cutaneous and Genito-Urinary Diseases*, vol. x., No. 120) states that the plan pursued by him for the purpose of procuring immunity against urethral fever after instrumentation is as follows:

When it is possible, some one of the urinary antiseptics is administered by the mouth for twenty-four to forty-eight hours before any instrumentation which might excite urethral fever. Great stress is not laid on this, the most that can come of it being a diminution of the pus coming from the kidneys, ureters, or bladder. Reliance cannot be placed on it to considerably diminish the fever. It is more efficient for disinfection of the upper and middle portions of the urinary passages than for the urethra, since the drugs, in weak solution, remain longer in contact with these membranes. Boric acid appears more efficient than the benzoates or salicylates. Salol has had no effect whatever.

All instruments are rendered aseptic by boiling in soda solution.

Borated glycerin alone is used as a lubricant. All fats, oils, and the more common vaseline are banished entirely. The reasons are obvious. With its affinity for water, glycerin can be easily and completely washed from the rough surfaces and slots of all instruments. This lubricant must be kept in a closed vessel, else it quickly becomes too thin by absorbing moisture. It is a clear fluid, which becomes opaque when infected. When brought in contact with the urethral mucous membrane, its affinity for water causes an outpouring of fluid, which flushes the mucosa even in its depths, promoting absorption at the same time. The boric acid prevents decomposition of the secretions excited. On the other hand, it is practically impossible to keep clean instruments lubricated with vaseline and the like substances. It is difficult to wash such substances away even with soap and hot water; they dry in the slot of a urethrotome or in the pocket behind the eye of a catheter, become gummy, and it is almost impossible to remove them.

Before any instrumentation the foreskin is retracted, and the glans and prepuce are thoroughly washed with the boro-salicylic acid solution of Thiersch.

The nozzle of an ordinary rubber injection-bulb filled with the same solution is then introduced into the meatus, the slack is caught up with thumb and forefinger, and the anterior urethra is filled and allowed to empty itself several times.

With the meatus firmly compressed around the nozzle, an attempt is now made to wash the posterior urethra by overfilling the anterior part and maintaining the pressure long enough to overcome the compressor. Failing in this, an Ultzmann's syringe-point is introduced fully within the grasp of the compressor, and the posterior portion of the urethra is washed backward into the bladder.

To sum up, an attempt is made to practise urethral asepsis by preventing the introduction of septic material into the canal, and antisepsis by washing both the anterior and posterior parts of the duct clean of its own secretions.

It is only since adopting all of these methods of asepsis and antisepsis that a comparative immunity against urethral fever has been obtained.

EXCISION OF CANCER OF THE RECTUM.

MCCOSH (*New York Medical Journal*, vol. lvi., No. 10) reports five cases of cancer of the rectum, all successfully operated on, in so far as the life of the patient was concerned, all experiencing great relief from suffering, and four resulting in a functional anus. In one case ten inches of the rectum were excised.

The sphincters were retained and the bowels were united by a secondary operation. The patient gained thirty pounds in weight; seven months afterwards was free from recurrence, and, excepting when the bowels were loose, exercised perfect control over the functions of the sphincter.

A number of incisions have been devised in this operation, but the approach which presents most advantages is by one of the sacral methods. This gives a larger and more direct opening to the seat of cancer, and enables the surgeon to both see and feel what he is doing. A much higher point in the rectum can be reached, even above the sigmoid flexure, and if suture of the gut ends is necessary, this can be accomplished directly under the eye of the operator. Against this method it is alleged that it weakens the pelvic floor, that there is greater tendency to prolapse of the bowel, and by disturbance of the sacral nerves the functional control of the rectum must be lost.

Division of the posterior branches of the sacral nerves is of little moment, as no important tissues are supplied by them. Division of the anterior branches of the fourth and fifth nerves is also unimportant. Division of the anterior branches of the third nerve should be avoided, as they enter into the formation of the ischiatic plexus, and serious changes in the innervation of the pelvic organs are liable to follow injury of either of these nerves.

The most prominent of the sacral methods are as follows:

Kraske's Operation.—The patient is placed on the right side; the incision begins in the median line of the middle of the sacrum, and extends to the anus. The soft parts being retracted from the bones, the lower part of the insertion of the left gluteus maximus muscle is loosened from the side of the sacrum. The coccyx is excised. The lower part of the sacro-sciatic ligament is divided. The lower part of the left wing of the sacrum is then cut away with the chisel, following a bowed line, which begins on the left edge of the bone, at the level of the third sacral foramen, and curves inward and downward along the lower border of this foramen, and then around and down to the end of the bone. After the bone is made smooth, the patient is placed in the lithotomy position, and, the tissues being retracted, the cancer is freely exposed.

Bardenhauer's Method.—The incision runs from the middle of the sacrum through the anus to the sphincters. The soft parts are separated from the coccyx and lower part of the sacrum until the edges of the bone are exposed. The ligaments are divided. The sacrum is then cut transversely across, just below the third sacral foramen. The soft parts may be divided by a transverse incision on each side, if more space is needed.

Heineke's Method.—By this the sacrum is divided vertically, and afterwards the lateral halves are united with suture. The incision extends from the level of the third sacral foramen down below the tip of the coccyx, and from the upper end of this a transverse incision is carried outward on each side. The bones are then sawed through vertically in the median line as high as the fourth sacral foramen. At this point the sacrum is sawed transversely across, and each half is retracted. After excision of the cancer, the bones are united by sutures.

Kocher's Method.—The incision extends in the median line from the level of the posterior superior spine of the ilium downward as far as the coccyx. On each side the soft parts are separated from the bone as far laterally as the posterior sacral foramina and as high as the third foramen. By means of a chisel, a groove is cut on each side of the sacrum along the inner edges of the foramina, beginning at the third and extending to the end of the bone. The flat segment of bone included between these lines is then removed, thus freely opening the spinal canal. The course of the sacral nerves can then be plainly seen, and they can be drawn aside, so as to be safe from injury. The sacrum and coccyx are divided vertically in the median line as high as the third foramen, at which point the bone is divided transversely, and the important third and fourth nerves being carefully guarded, each half of the sacrum is drawn aside and the rectum freely exposed. When the diseased rectum has been removed, the lateral halves of the bone are approximated and sutured.

In cases of extirpation, the author holds that the cut end of the rectum should always be sutured to the margins of the wound; the fæcal matter will thus be guided through its proper canal to its point of exit. If the rectum is properly loosened above, and it is important that this should always be done, there should be but little tension on the sutures. Experience has shown that recession of the rectum thus fastened seldom takes place.

Arndt found that in one hundred and ten cases where the gut was sutured to the skin,

nine died, a mortality of 8.18 per cent.; in seventeen cases in which the gut was not sutured, three died, a mortality of 18.6 per cent.,—a percentage of deaths more than twice as great as in the suture cases. In eighteen cases in which after circular sewing the sutures tore out and fæces escaped, four died. When the peritoneal cavity has been freely opened, packing with mild iodoform gauze represents the best form of treatment.

The avoidance of infection after operation is a matter of exceedingly great importance. The escape of fæcal matter into the cellular tissue of the pelvis is usually apt to occur after circular suture. Perhaps one of the most radical means of preventing such a complication is the performance of a preliminary colotomy. This, however, is not necessary, provided the gut is sutured to the skin. The space around the rectum could be sufficiently packed with gauze to prevent infection in the great majority of cases.

On the other hand, where resection and circular suture have been done, preliminary colotomy seems a very proper procedure. When the cancer is so adherent to the surrounding parts that it will be impossible to completely remove it, radical operation is not to be considered. In cases, however, where there seems a reasonable prospect that all the diseased portion can be removed, resection of the rectum should be attempted. There can be no doubt but that colotomy is the safer operation of the two, so far as the death-rate is concerned, and were there in either case no prospects of cure or of long immunity from disease, colotomy should be preferred to excision. The latter operation, however, not only relieves pain and prolongs life to a greater extent than colotomy, but in a few cases effects permanent cure. As to the mortality, of four hundred and thirty-nine cases recorded, there were eighty-four deaths,—a death-rate of 19.1 per cent. The mortality of colotomy in cases of acknowledged gravity cannot be more than one-half that of the radical operation. As to the question of permanent cure, out of three hundred and seventy-five cases, thirty-two were free from recurrence at the end of four years. In almost all of these the diagnosis had been confirmed by means of the microscope. Many of these cases reported as cured were alive and well long after the expiration of four years.

Kocher has five patients who were perfectly well more than nine years after operation, one having lived sixteen years and a half. Czerny reports a case perfectly well at the end of twelve years after operation. In this case he excised more than five inches of the rectum.

A study of statistics in regard to the prolongation of life shows that after extirpation, even should the disease still progress, the length of life is about one-third greater than is the case after colotomy. Should there be a relapse, a second or third operation may finally result in cure. Arndt reports a patient who had four relapses and five operations, and was well at the end of thirty-nine months from his last operation and nearly eight years after his first excision.

Other authors have reported cases where, after three operations, permanent cure resulted.

In regard to the functional result, the author states that, while the anus is situated in the natural position after excision, yet the control is no better than is obtained after colotomy.

Reviews.

THE PHYSICIAN'S LEISURE LIBRARY. THE USES OF WATER IN MODERN MEDICINE. By Simon Baruch, M.D. Vol. II.
Detroit: Geo. S. Davis, 1892.

We have already reviewed in the THERAPEUTIC GAZETTE the first volume of this interesting little work by Simon Baruch. In it he gives more fully than before the best methods for applying hot and cold water in the treatment of disease. As with most works divided into two volumes, the second volume is of necessity more interesting than the first, because practical results are more carefully spoken of, the first volume being necessarily devoted more largely to the consideration of the subject from a preliminary stand-point.

This volume is illustrated by a number of interesting cuts, which serve to indicate the manner in which the applications should be made. As the method of making these applications is an important part of the treatment, the cuts add very materially to the value of the publication. When we consider that each volume of two hundred and twenty-eight pages is sold for the extraordinarily small amount of twenty-five cents, the day is past when the average practitioner can protect himself from the accusation of ignorance in regard to this most valuable remedial measure.

THE ESSENTIALS OF DIAGNOSIS ARRANGED IN THE FORM OF QUESTIONS AND ANSWERS. PREPARED ESPECIALLY FOR STUDENTS OF MEDICINE. By S. S. Cohen, M.D., and A. A. Eshner, M.D. Illustrated. Philadelphia: W. B. Saunders, 1892.

The authors of this book disarm criticism as to their method of presenting diagnosis by the next to the last paragraph in the preface, in which they state that, "diagnosis must be studied from patients, not from books; even the best of books can only direct the student what to look for at the bedside, and warn him against probable errors."

The definitions which are given in answer to the questions are, as a general rule, unusually clear, and the authors are to be complimented upon the ability which they have shown in the boiling down into short, pithy sentences the gist of most of the subjects considered. We think, however, that, in view of the elementary character of the book, the answer as to the question, "What is fever?" is unnecessarily complex.

The statement that recovery from tetanus is exceptional is certainly correct. That quinine cures malarial hæmaturia and not paroxysmal hæmaglobinuria is not true, at least so far as differential diagnosis is concerned. The *facies* of one sick with yellow fever can scarcely be called "fierce." On page 61, "inflexion" should read "injection." Rötheln is more commonly called German than French measles.

Influenza is not a sufficiently severe disease to separate it clearly from dengue, and we doubt if such a thing as "chronic diphtheria" does exist.

The description of hydatid disease is very incomplete.

The statement that in acute articular rheumatism pericarditis and endocarditis can sometimes be detected, is a mild way of stating a frequent complication. It is untrue that gout never produces endocarditis. Parotitis (simple) and mumps (infectious) should be separately considered.

Some of the questions in differential diagnosis are unnecessary, particularly as necessary questions are excluded. Thus the diagnosis between cerebro-spinal meningitis and torticollis would probably be made by the patient. We are told the difference between the eruption of measles and typhus fever, but not between varicella, syphilis, and measles.

Points as to the differential diagnosis between malarial disease and relapsing fever would be more useful than between relapsing and yellow fever.

The book is illustrated by cuts taken from the works of standard authors. In the discussion of the diseases of the nervous system, Gowers affords most of these illustrations, and English, German, and French clinicians provide their illustrations in various portions of the book. On page 173 a colored drawing illustrates the appearance of tubercle bacilli after being stained, and on page 164 the micrococcus of croupous pneumonia is similarly pictured.

It is difficult to review such a book as this, since it professes to be nothing more than a compilation of facts from standard authorities, and the very character of its composition prevents the authors, who, in one sense, might really be called editors, from evidencing much literary ability or originality, except in the very necessary talent of being able to express an idea clearly and concisely in a small space.

THE HAND-BOOK OF HYGIENE AND SANITARY SCIENCE. By George Wilson, A.M., M.D., F.R.S. (Edin.). Seventh edition. Philadelphia: P. Blakiston, Son & Co., 1892.

This manual of hygiene, which is comparatively brief as compared to the larger work of Parkes, nevertheless covers the ground sufficiently to prove satisfactory to the purchaser who desires to study the main points and outlines of preventive medicine. The work opens with a chapter upon "Public Health and Preventable Diseases," which, to a certain extent, is historical, and is followed by a section devoted to the subject of "Food in its Relation to Work and Health." There is also a section upon the "Diseases which render Flesh of Animals Unfit for Human Food," and another upon the "Examination of Animal Foods," both of which are exceedingly valuable, the latter being particularly important to every physician.

This section is completed by an article upon "The Effect of Insufficient or Unwholesome Food upon Public Health." There are also chapters upon "Climate," "Ventilation," "Water," "Water Analysis," and "The Disposition of Sewage and House Refuse," as well as others upon "Dwellings," "Hospitals," "Solutions," and "Liquids."

Finally, we have considered the "Contagious and Infectious Diseases," the "Disposal of the Dead," "Vital Statistics," and information concerning the duties of medical officers of health.

The style of the book is agreeable, and the text is not cumbered by collateral subjects, as it is in some larger and more thorough,

and therefore more complete, works on hygiene. Many of the chapters in this book will be a surprise to physicians, who have been so busy in the practice of medicine that the questions here discussed have been overlooked. The book should have a large sale, as it is very appropriate to American needs, which is more than can be said of many works of English medical authors.

Correspondence.

LONDON.

(From an Occasional Correspondent.)

THE ROYAL LONDON OPHTHALMIC HOSPITAL.

Having decided to spend one year abroad in the special study of the eye, and wishing to make every moment count to the best advantage, the question arose, Where should I go? Most students of the eye spend six months in Paris and Vienna, and the remaining time in London. Undoubtedly Paris and Vienna do offer great advantages to the student in acquiring a thorough groundwork of the subject, and those who are conversant with French and German should unquestionably avail themselves of the facilities which these cities afford. But those who only understand English make a great mistake when they spend valuable time battling with a foreign tongue. For, after all, it is clinical experience that counts, and in this respect the Royal London Ophthalmic Hospital, better known as "Moorfields," stands pre-eminently the greatest eye hospital in the world.

So I came to "Moorfields," and my choice is confirmed, by noticing that the students who come to London after a six months' stay in Vienna are mixed as to their knowledge of German, and probably a little more so as to the eye.

"Moorfields" is an unpretentious three-story brick building, which stands in the very heart of London, about five minutes' walk from the Bank of England. The ground floor is entirely devoted to the out-door department. The operating-room and wards are up-stairs, and have accommodations for nearly one hundred patients.

In the report for 1891, the in-patients numbered 1892; out-patients, 25,558; with a total attendance of out-patients, 109,756. To examine and treat this vast multitude, three surgeons are on duty each day from 9.30 A.M. till 2 P.M. Messrs. Nettleship, Gunn, and Lawford serve on Wednesdays and Saturdays; Messrs. Cowper, Tweedy, and Morton, Tuesdays and Fridays; and Messrs. Tay, Lang, and Silcock, on Mondays and Thursdays.

Any physician or surgeon may become a student at the hospital for six months on payment of $15.75, or a fee of $26.25 entitles him to the perpetual privileges of the institution. From these students each surgeon appoints a number of clinical and junior assistants, usually about ten. These appointments are made in May and November, the clinical assistants serving for a term of not less than one year and the juniors for six months.

The assistants are not limited to serving under any one surgeon; and, in fact, if you make yourself useful, you find no difficulty in being appointed by three men, and so working every day in the week. There is plenty of work to do, and the staff is only too pleased to have active and reliable men as aids. It doesn't do to resent treating cases of granular lids, nor to sneer at cases of refraction until a pretty girl comes along; but he who pitches in, takes every case as it comes, soon receives the notice of his chief, and has his reward in being given the important cases.

You early find that you have to rely upon your own resources, as the surgeon is busy with his new cases and cannot be annoyed by half a dozen men seeking his advice on simple cases of refraction, etc. At the same time the staff is exceedingly kind, and willingly clear up any doubtful point.

The patients are drawn to "Moorfields" from all parts of the United Kingdom, and begin to arrive as early as 8 A.M., and continue to come, in increasing numbers, until ten o'clock, when the doors are closed.

Each new patient is given a "letter" by the clerk, which records his name, age, occupation, and address, as well as the name of the surgeon at whose hands he is to receive treatment. All the records of the case are made upon this letter, and the patient is directed to carefully preserve it and bring it at all subsequent visits.

The senior assistants arrive at about nine o'clock, examine the old patients and continue the treatment. At half-past nine the surgeons usually put in an appearance, and from that time until two in the afternoon the scene is a busy one. The porter arranges the patients into six lines, three of old and three of new, and one by one they file up to their respective desks.

As each new patient reaches the desk, he hands his letter to the surgeon, who examines the eye, makes the diagnosis, and orders treatment. Cases for refraction or the ophthalmoscope are sent into the waiting-room behind, where they receive the attention of the assistants.

At a little distance in the rear of the desks are six complete sets of trial lenses, two for the use of each surgeon.

Usually there are ten to fifteen assistants busy with the refraction cases, so that across the room stretches a line of patients, all anxious to read $\frac{6}{6}$, and an equal number of doctors aiding them to the best of their abilities.

Back of the trial cases, the large examining-room is subdivided into three smaller rooms, so that the patients of each surgeon can be kept separate. These rooms are always crowded, and as the test-cards hang against the far wall, it is often a difficult task to keep a clear view for refractive purposes.

When I first came to "Moorfields," I was as much confused by the bustle and activity as is one who pays a first visit to a stock exchange and witnesses the activity of the brokers.

It had always been my custom, in refraction cases, to have my patient comfortably seated in a chair, with an unobstructed view of the test-cards; but here was a line of people extending from one side of the room to the other, all standing, the refracted craning their necks to read the test-type, and the refractors turning about every minute to see that they had a clear track.

Although there is so much apparent confusion, each case receives a routine and thorough examination. The distant vision is taken, and any manifest ametropia recorded in the following manner: R.V. $\frac{6}{6}$ H.m. sph. $+ 1.50$ D $= \frac{6}{6}$. The accommodation is taken with Jaeger's test-type, and recorded J1 15 to 45 centimetres.

If a satisfactory result is not attained, atropine or homatropine is ordered. In the case of children, guttæ atropine, 2 grains to 1 ounce, or unguentum atropine, 4 grains to 1 ounce, is ordered three times a day, and patient told to report in three days or a week. Older patients have a few drops of homatropine, 4 grains to 1 ounce, or homatropine and cocaine in castor oil instilled under the lids, and examined as soon as the accommodation is paralyzed. The surgeons at "Moorfields" do not hesitate to use homatropine in old people, provided the tension of the eyeball is normal. The cases are now taken into the dark room for retinoscopy and ophthalmoscopic examination. The dark room is quite large, and well ventilated from above. It is divided into nine stalls, three for the use of each surgeon.

There are two unwritten laws in force at "Moorfields,"—

1. Do not appropriate your neighbor's trial-frames.

2. Keep to your own stalls in the dark room.

Retinoscopy is a very favorite method of estimating refraction, for after a little practice the most difficult cases of astigmatism may be correctly estimated in a few moments. The following method, taken from Morton's "Refraction of the Eye," is in force:

"First, as to the mirror; it is well to have a good sized one, as the shadows are clearer and more easily studied. My mirror is concave, four centimetres in diameter, with a central perforation of four millimetres, and has a focus of twenty-two centimetres."

The remarks which follow apply to a concave mirror: "The observer must always be seated at the same distance from the patient,—viz., about one to four metres."

The accommodation being paralyzed by homatropine or atropine, a screen should be placed over one eye, and the patient should look at the sight-hole in the mirror.

The situation of the principal meridians should then be roughly ascertained, and the degree of refraction tested with glasses. It is more convenient to test each meridian separately, and with spherical glasses only in the first instance.

If the shadow move against the mirror, or if, with a bright reflex, there is no definite shadow movement, we have a case of emmetropia, hypermetropia, or weak myopia.

If the shadow appear to move with the mirror, the eye is myopic, at least one dioptre.

To ascertain the actual refraction while the eye is still under atropine: *Deduct* $+ 1$ *D* (*a*) from the *weakest convex* glass, which *reverses* the shadow, if it originally moved against the mirror. (*b*) From the *strongest concave* glass with which the shadow *continues* to move *with* the mirror, if it originally had this direction.

The feebler the luminous reflex and the slower the movement of the shadow across the pupillary area, the greater is the amount of ametropia.

Glasses ordered for permanent use must, when *convex*, be 1 D, or occasionally 1.50 D, *weaker;* and when *concave*, .25 D to .75 D *stronger* than is indicated by the measurements

made under atropine. In myopia, however, this addition is seldom required.

With spherico-cylinders, any modification necessary may almost invariably be effected by means of the spherical lens alone. In all estimations of errors of refraction, atropine or homatropine is absolutely necessary if perfect accuracy be sought for.

After retinoscopy, the eye is examined by focal illumination, and any foreign body, or delicate opacities of the cornea or vitreous, noted. A convex lens of 3 D is now turned behind the ophthalmoscope, so that the surgeon may not use any accommodation, and the details of the fundus studied by the indirect method. The lens used to focus the rays is + 16 D, and is much larger than those usually used in the States; the diameter of mine is six centimetres.

By the direct method, the cornea and lens are examined for fine opacities through a convex lens of 20 D. The state of the vitreous is observed through a convex lens of 8 D, and finally the fundus is studied and the refraction estimated.

The Morton ophthalmoscope is the one most in favor. The lenses are attached to an endless chain, and run down through the body of the instrument, and by means of the wheel at the bottom the lenses can be turned into place without removing the ophthalmoscope from the eye. The operator has command of convex lenses from .5 to 32 D, and concave lenses up to 50 D. The small, slanting mirror is two centimetres in diameter, with a central perforation two millimetres in diameter, and turns upon itself to any angle. For the indirect examination, the large mirror can be rotated to occupy the place of the small mirror. Its diameter is three centimetres, with a perforation of three millimetres.

The treatment of diseases of the eye may be outlined as follows:

Simple cases of conjunctivitis are ordered a lotion of boric acid or alum, an ointment of boric acid or vaseline, with cold compresses applied for twenty minutes three or four times a day.

Follicular conjunctivitis receive one of the above lotions, with drops of sulphate of copper, and an occasional application of weak solution of silver nitrate.

Chronic granular ophthalmia is of very frequent occurrence among the poor of London, and often defies the best of treatment. Mild cases are treated at the hospital with a brushing of silver nitrate, five to ten grains to the ounce, with soothing lotion, and ointment of the yellow oxide. More chronic cases receive an application of mitigated lapis or lapis divinus, with cold sponging. When the granulations are large, numerous, and intractable, the lids are everted, powdered cocaine applied, and the granulations either squeezed out between the blades of a pair of strong, curved forceps or removed by the actual cautery.

Phlyctenular conjunctivitis is best treated with an ointment of yellow oxide and warm fomentations of boracic acid.

Phlyctenules of the cornea receive the above treatment with the addition of eserine or atropine. Eserine is most employed, and atropine is only ordered when the ulceration is central, with a tendency to perforate. When the ulceration is small but deep, paracentesis of the anterior chamber, through the floor of the ulcer, assists most materially in the cure. When the ulcer is spreading, or if there is hypopion, it is cauterized with the galvanocautery, taking care to get well into the sound tissue. Cocaine is added to the drops or ointment to control pain, and a pressure bandage ordered. The mild cases only require a shade or dark-colored spectacles.

In the local treatment of *iritis*, atropine and warm applications still remain the prominent features.

Disorders of the Lachrymal Apparatus.— The favorite method of treatment is to dilate the puncta with a Nettleship dilator, and pass one of Bowman's probes into the nasal duct. After the stricture is dilated, the duct is washed out with Anel's syringe, using a solution of either perchloride, zinc, alum, or boracic acid. At subsequent visits (twice a week) the duct is syringed, and if the fluid does not pass into the nose, the duct is probed. This method is very successful, and at the same time does not injure the puncta or canaliculus.

During the course of the morning the surgeons, in turn, go up-stairs to the "theatre," examine the in-patients, and perform any necessary operations. The theatre is about fifteen by twenty feet, and is well lighted by one large window. At either side of the operating-table stands a small platform, for the use of students and visitors. The room is in charge of the house surgeon, assistant, and two nurses. The first administers the anæsthetic and assists the surgeon; the second selects the various instruments necessary for the operation and places them into a tray filled with a solution of carbolic acid, 1 to 20. The eye to be operated upon is thoroughly irrigated with perchloride solution, 1 to 5000, and cocaine, ten

per cent. solution, instilled. The blood and other discharges are removed with dry sal alembroth wool. After the operation, the eye receives a dry dressing of cyanide of mercury and zinc gauze, and a roller bandage applied.

During the year 1891 three hundred and twenty-eight senile cataracts were extracted. Of this number, two hundred and twenty-four were removed with iridectomy, seventy-three without and thirty-one with a preliminary iridectomy. Messrs. Nettleship, Lang, and Lawford prefer extraction without iridectomy in favorable cases, doing a subsequent iridectomy when a prolapse of the iris occurs. By referring to the table, it will be noticed that the number of iridectomies necessitated by prolapse of the iris bears a striking resemblance to the number of extractions without iridectomy. Of course, allowance must be made for prolapse from other causes. The majority of the surgeons still prefer the safer, though less brilliant, method. Dr. Marcus Gunn makes it a rule to do a preliminary iridectomy, and claims the minimum amount of danger to the eye.

PHARMACOPŒIA.

Fomentum Acidi Borici.

Boric acid, ʒvi to aquæ, Oi.

Guttæ—Drops.

Nitrate of silver, gr. i, ii to ʒi.
Sulphate of atropine, gr. i, ii, iv to ʒi.
Sulphate of atropine, gr. ii
Hydrochlorate of cocaine, gr. x } to ʒi.
Sulphate of copper, gr. ii to ʒi.
Sulphate of daturine, gr. ii to ʒi.
Sulphate of duboisine, gr. i to ʒi.
Homatropine, gr. iv to ʒi.
Hyoscine, gr. ii to ʒi.
Eserine, gr. ii, iv to ʒi.
Eserine, gr. i
Cocaine, gr. v } to ʒi.
Nitrate of pilocarpine, gr. ii to ʒi.
Sulphate of zinc, gr. ii to ʒi.
Chloride of zinc, gr. ii
Cocaine, gr. x } to ʒi.

Lotiones—Lotions.

Boric acid, gr. xix to ʒi.
Alum pulv., gr. vi to ʒi.
Alum, gr. iii
Sulphate of zinc, gr. i } to ʒi.
Glycerin of borax, ʒi to ʒi.
Perchloride of mercury, gr. ⅛ to ʒi.
Bicarbonate of sodium, gr. x to ʒi.
Chloride of zinc, gr. i to ʒi.
Sulphate of zinc, gr. i to ʒi.

Oleum Homatropinæ cum Cocaine.

Homatropine, pure.
Cocaine, alkaloid, aa gr. x.
Castor oil, ʒi.

Unguenta—Ointments.

Powdered boric acid, ʒi; soft paraffin, ʒi.
Atropine, alkaloid, gr. iv; soft paraffin, ʒi.
Atropine, gr. iv
Powdered boric acid, ʒi } soft paraffin, ʒi.
Atropine, gr. iv
Cocaine, gr. x } soft paraffin, ʒi.
Yellow oxide of mercury, gr. iv to gr. viii; soft paraffin, ʒi.
Yellow oxide, gr. iv
Atropine, gr. ii } soft paraffin, ʒi.
Ointment of nitrate of mercury, 1 part; soft paraffin, 7 parts.
Precipitated iodoform, 1 part; soft paraffin, 7 parts.
Precipitated iodoform, ʒi
Atropine, gr. ii } to ʒi.

JOHN ELLIS JENNINGS, M.D.

THE TREATMENT OF PLEURISY.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—Under the above caption, in the THERAPEUTIC GAZETTE for August, page 538, is the following quotation from Alphonse Guerin: "If acute pleurisy were treated by bloodletting, blisters, etc., according to the method of Laennec and his followers, there would be scarcely any occasion for the practice of thoracocentesis." I wish to place myself on record as heartily indorsing the above quotation, and I am backed by a practice of thirty-six years, with an average per cent. of pneumonias and pleurisies, and have not had a single case requiring thoracocentesis, while I have witnessed many such cases in the hands of other physicians who were opposed to and refused to adopt this (heroic) treatment. While I am a strong advocate for these remedies, and have been ever since I saw a case die, as I think, for the want of them, about thirty-four years ago, in the hands of an intelligent physician, I am not in favor of a reckless and indiscriminate use of them. I carefully select my cases, and, as I have said in a previous article on this subject, I have never bled a case that did not recover, and they have usually been cases that were considered hopeless by consulting physicians and friends. I might go into particulars, and give cases in my practice parallel with cases in the hands of my brethren, but this would look like making invidious comparisons, and, too, would take up too much of your valuable space.

R. L. HINTON, M.D.

PRESCOTT, NEVADA COUNTY, ARK.,
September 8, 1892.

VOLUME